Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 6.] NEW-YORK, AUGUST 2, 1851. [NUMBER 46.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton, street, N. Y., (Sun Building,) and 13 Court street, Boston, Mass.
BY MUNN & COMPANY,
The Principal Office being at New York.
A. T. Hotchkiss, Boston.
Dexter & Bro., New York City.
Weld & Co., New Orleans.
Stokes & Bro., Philadelphia.
Jno. Thomson, Cincinnati, O.
Cooke & LeCount, San Francisco, Cal.
Courtenay & Wienges, Charleston, S. C.
John Carruthers, Savannah, Ga.
Barlow, Payne & Parken, London.
M. M. Gardissal & Co. Paris.
Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS---$2 a-year---$1 in advance and the remainder in 6 months.

Rail-Road News.

Illinois Railroads.

The following railroads in Illinois are in course of completion, and some of them in successful operation, viz: The Chicago and Galena Union Railroad; the Rock Island and La Salle Railroad, with its extension to Chicago; the Peoria and Oquawka; the Quincy and Meredosia; the Alton and Terrehaute; and the Illinoistown and Vincennes Railroads. We add to the above list the Sangamon and Morgan Railroad, already completed from Springfield to the Illinois river, and the Alton and Sangamon Railroad. This latter road was chartered in 1847—a preliminary survey was made in 1848; in the fall of 1849 the full amount of stock for which the books were opened was subscribed, and in February, 1850, the company was duly organized and ground broken. The section of country traversed by this road is among the best and oldest settled of the State, and there is already a population in the counties traversed by the road of over twenty-two to the square mile; and this road is the only direct outlet to the Mississippi for the counties along the line or adjoining Sangamon.

Rochester and Syracuse Railroad.

The Rochester and Syracuse road has declared a semi-annual dividend of 5 per cent. The directors held a meeting on the 4th inst., at which it was resolved to create new or additional stock to the amount of $1,500,000, to be divided into shares of $100 each, to be distributed pro rata, as near as possible, among the respective shareholders, according to the number of full shares held by them on the 21st of August next, who shall on the first day of August next, or within twenty days thereafter, pay to the treasurer of this company the sum of ten dollars on each share, on condition that the balance of the stock shall be paid in such instalments as may be required by the directors.

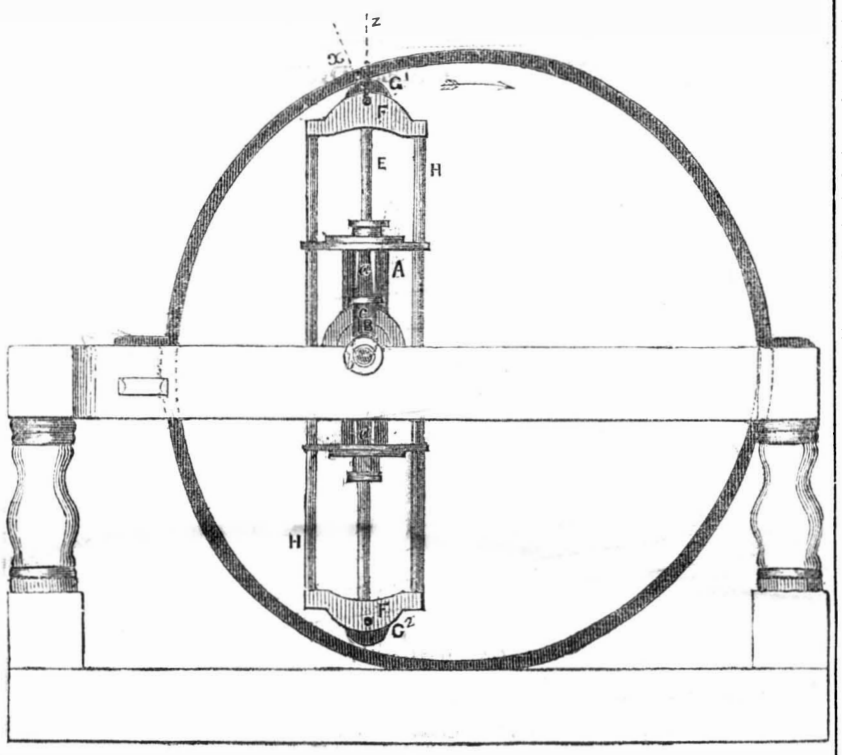
From Montreal to New York in 23 Hours.

Since the opening of the railroad between Brattleboro and Bellows Falls, an arrangement has been made by which passengers are brought from Montreal to New York in about 23 hours. They leave Montreal at 4 o'clock in the morning, Burlington at 8, and arrive at Hartford in the 9½ evening train from Springfield. The cars continue on to New York, and reach there before 3 A. M.

The Atlantic.

This fine steamship was to sail for this port on Wednesday last week from Liverpool. The adjustment of the machinery, we see it stated, was confided to Messrs. James Watts & Co., of the Soho Works, Birmingham, and the fittings up of the state-rooms, saloons, &c., has been under the superintendence of Mr. Miller, of the firm of Miller, Mackey & Co., of Glasgow.

NEW ROTARY CYLINDER ENGINE.---Figure 1.

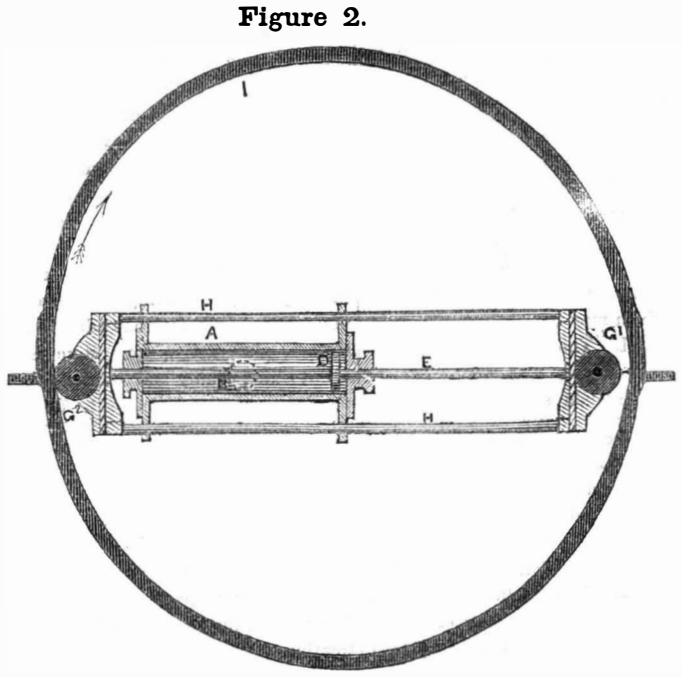


The accompanying engravings represent a new Rotary Engine, invented by Mr. S. Furman, of Romulus, Seneca Co., N. Y. Figure 1 is a side elevation, and figure 2, is a longitudinal section of the cylinder with other appendages to illustrate the action of the engine.

The nature of this invention is the employment of a reciprocating piston working within a cylinder hung or suspended at the centre of its length (more or less) on a shaft running at right angles to the cylinder, which, together with the piston and shaft are caused to rotate by the pressure of rollers or their equivalent attached by rods to the piston against a fixed curved way, so formed that the rotary motion is produced by either roller alternately, having its point of impelling contact situated on one side of an imaginary line passing through the centre of the cylinder, longitudinally. This rotary motion is aided or made continuous by a fly-wheel.

A is a cylinder hung or attached centrally of its length to a shaft, B, situated at right angles with it, the shaft, B, runs or is supported in bearings connected with the framing, and the cylinder, A, (in which a piston), D, works with a reciprocating motion for the length, or nearly so of the cylinder, has passages, *a a*, for the steam and exhaust, communicating with the cylinder as usual near either end, and terminating at about the centre of the cylinder where is situated a four-way valve, which serves to open either passage, *a a*, alternately to the steam pipe, *b*, and exhaust or waste pipe, *c*, the operation of it being so that steam is allowed alternately to act upon either face of the piston to propel it in either direction for the length or nearly so of the cylinder, while the steam, after having completed its duty, is allowed to pass off, whereby a reciprocating motion is maintained.

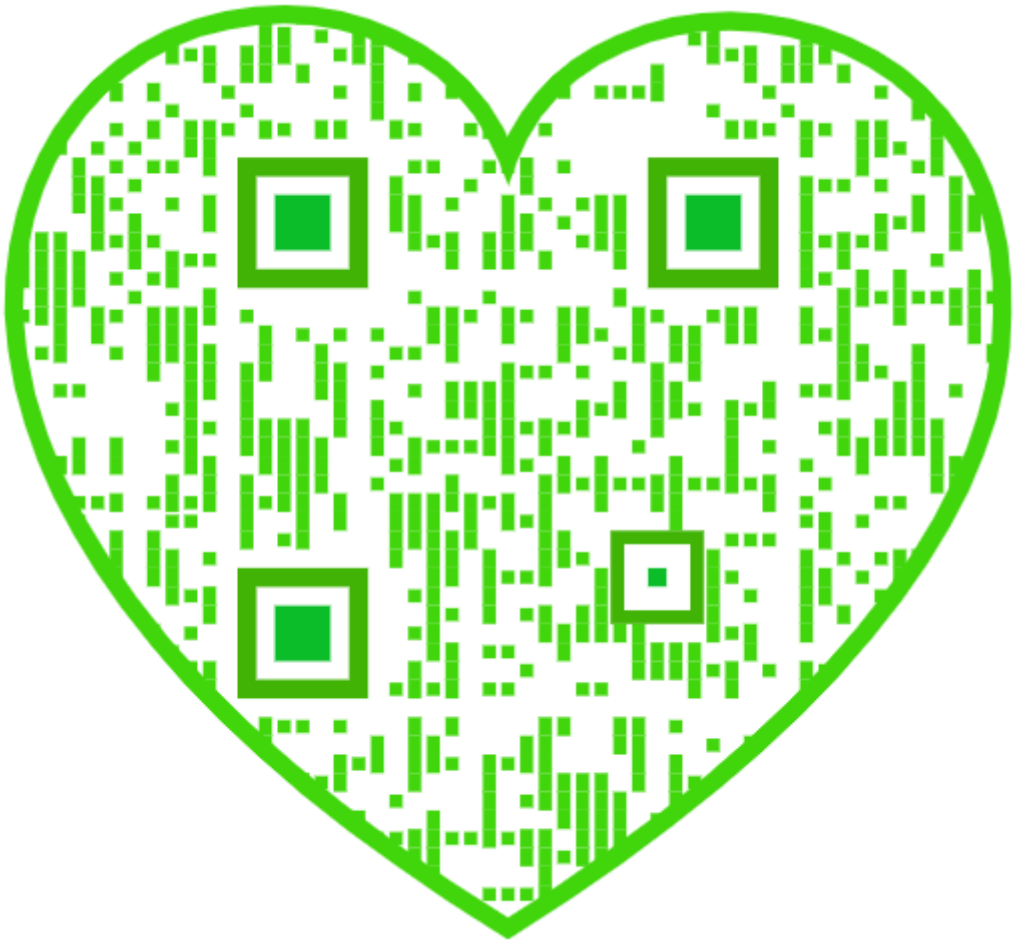
Figure 2.



E is the piston rod, which is shown to pass through both ends of the cylinder and secured to which, at the extremities, are cross-heads, F F, carrying rollers, G′ G². H H are guide and bearing rods connecting the two cross-heads, F F, and travelling through guide-holes made in or adjoining the cylinder covers. I is a fixed curved way so formed and positioned with relation to the shaft, B, as to be at right angles with its edge or rim on the one side of a vertical line drawn through the centre of the shaft nearer thereto than it is on the opposite side, and its curvature or shape, such as that the rollers, G′ G², will both touch, or nearly so, the internal periphery of the curved way, during each revolution of the shaft, B, that is, whilst the piston, D, is describing a stroke both ways of the cylinder; or the way, I, may be only so curved for that portion of it which lies above a horizontal line cutting the shaft through its centre, as seen by the position of the rollers in figure 1, and, if desired, where meeting such horizontal line at one or both ends of the upper portion, forming the dead power points of the engine; the way, I, may be so extended or shaped as that only one or neither roller will touch for a short distance of the travel, as seen by the roller, G′, in figure 2. Or such other modifications of the curved way may be made as found necessary or desirable in the working of the engine as applied to different purposes, its form and position being, as represented in the engravings, that which is considered most suitable for general applications, that portion of it being under a horizontal line intersecting the shaft at its centre, being designed only to serve as a guide for either roller to touch when the steam is off, so as to preserve the piston from dropping out of its place or injuring the upper portion, that is, the half or part situated above the said horizontal line being made exclusively the fulcrum or impelling surface, which either roller, G′ G², act against alternately; but, as already alluded to, the curvature of the way may be varied, or an additional curve be attached, by which the motion of the engine may be reserved; or, again, the rollers, G′ G², may be made to act on the outside periphery of a curved way instead of the inside, as shown. J is a driving pulley keyed on the engine shaft, and M is a fly-wheel also thereon.

The rotary movement of the Engine is effected in the following manner:—supposing steam to be pressing on the under side of the piston, as the cylinder is positioned in figure 1, then, as will be seen, the point of impelling contact with the curved way, I, is where the line, *x*, intersects the curved way, which, in being on one side of the vertical line, *z*, will cause, through the pressure outwards, of the roller, G′, the cylinder, shaft, and several parts to receive a circular motion in the direction as indicated by the arrow, the piston, D, having commenced the stroke, it will be then performing; that is from the end of the cylinder nearest the roller, G², towards the opposite end, when the cylinder is horizontally positioned, as in fig. 2, on its next arrival (or rather before), at which position it terminates its one stroke and commences its other stroke, the reciprocating action of the piston causing the rollers, G′ G², alternately thus to operate on that portion of the curved way which lies above a horizontal line intersecting the shaft at its centre, and the cross-heads, F F, alternately, as they are thrown outwards from the cylinder, occupying the position of the one carrying the roller, G′ in figure 2, serving, in combination with the fly-wheel attached, to act as a compensating force when the steam is shut off to carry the cylinder past its dead points which, as before adverted to, are where the horizontal line intersecting the shaft at its centre cuts on either side the curved way; so that either roller when positioned as, or a little in advance of the roller, G², in fig. 2, will commence to exert by the action of the piston, its propelling power for the production of a rotary motion, and will continue so to exert power in the manner described until nearly arriving to the position of the roller, G′, in figure 2, the tendency to the production of a

© 1851 SCIENTIFIC AMERICAN, INC.



rotary motion being less as approaching or situated near the dead power points, but being as regards direction of force similar to that already specified and as illustrated by the intersecting lines, x z, and arrow.

More information may be obtained by letter addressed to Mr. Furman as above.

Miscellaneous.

Special Correspondence of the Scientific American.

British Scientific Association, &c.

LONDON, July 11th 1851.

The British Association for the advancement of science, met on last Thursday (3rd) in the Corn Exchange, Ipswich. Sir David Brewster, the President, made an address on resigning the chair to his elected successor, Prof. Airy, the Astronomer Royal. He noticed in a tone of complaint the neglect shown by the Government to scientific pursuits, and to scientific men, and he alluded particularly to the refusal of the application of the association, backed as it was by the Royal Society, to have a powerful reflecting telescope stationed for the examination of the nebulæ of the northern hemisphere. He consoled the meeting, however, with the reflection that Governments do not last forever, that rays of light will penetrate through darkness, and that even the hide of the rhinoceros is vulnerable in points. From these observations on the Government, Sir David launched forth in praise of Prince Albert, who had so prominently come forward as the patron of science and arts; and he spoke in an enthusiastic manner of the Crystal Palace and its contents, as the magnificent result of the Prince's patronage and active exertions in promoting the success of the exhibition.

Professor Airy read his presidential address rapidly but distinctly. He touched lightly on the progress of science in all branches during the last year, more particularly on those with which the British Association is more closely connected, and pointed out what the Association has done for furtherance of its great objects. He spoke of the persevering efforts of Lord Ross, to perfect the mechanical arrangements of his great reflecting telescope, in which considerable improvements had been made; also of the labors of Mr. Ross, in the improvement of chromatic instruments. As a consequence of the progress of optical glass manufacture, at the works of Mr. Chance, of Birmingham, Mr. Ross has succeeded in making an object glass, two feet in diameter, that of the large telescope at the Exhibition being fifteen inches. The admirable specimens of engineering skill, exhibited by Mr. Ransome, of Ipswich, in the construction of stands for some of the large instruments at the Royal Observatory, at Greenwich, were also dwelt upon by the president with much satisfaction. From astronomical instruments, he proceeded to notice the discoveries that have been made by their means, the dispersion of the nebulæ into distinct systems of stars, the three new planets, and the ascertainment of the distance of the nearest star to our solar system.

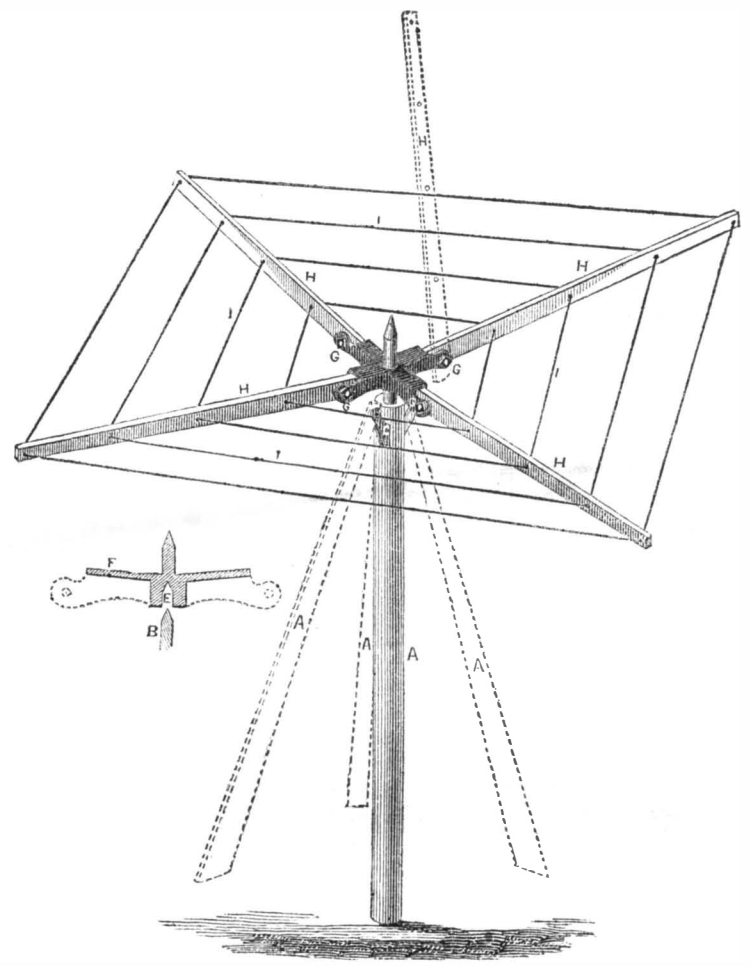
With regard to the recent excitement regarding M. Foucault's experiments, rendering visible the rotation of the earth, the president stated that there were special adjustments to be made for different latitudes before any correct deductions could be drawn from the vibrations of the pendulum independently of the earth's rotation. In reference to investigations respecting terresterial magnetism, he alluded particularly to Prof. Faraday's discovery of the magnetic property of oxygen, and the important bearing it might have in elucidating the mysterious phenomena of the magnetism of the earth, though as yet it had not been subjected to sufficient examination to have any practical value. Before leaving the subject of astronomy, the president adverted to some experiments recently made in America, from which it would appear electricity is transmitted through iron wires with the velocity of 15,000 miles per second, and to the applicability of the rapid transmission of electricity to noting corresponding celestial phenomena.

The other branches of science were noticed very briefly, and in none of them were there any remarkable advances to be recorded. In the improved appliances of mechanics a new construction of diving bell, consisting of an elongated tube, was mentioned, by means of which works at the bottom of the sea could be conducted with greater facility. The president observed that this country had no academy of sciences supported by the Government, and for his part, he thought it was better that scientific research should be left to the individual exertions of those who took interest in the subject, and could pursue their own modes of investigation independently.

Prof. Airy is a great man; when appointed to the Royal Observatory at Greenwich some years ago, there were the observations of 80 years not reduced, and the herculanean task of reducing this mass of valuable ore into practical form, so as to render it sterling metal had been assiduously accomplished by Professor Airy, with assistants acting under directions, and he had so far brought up the arrears, that the observations made at the observatory up to July were reduced to practical form.

Prince Albert was in attendance, and Professor Philips, the assistant general secretary, stated that the members who had passed the treasurer's books during that day had been 478, of whom 111 were ladies, and 16 distinguished foreigners. EXCELSIOR.

DICKEY'S PATENT CLOTHES DRYING MACHINE.



The accompanying engraving is a perspective view with a small section of the spindle, B, centre tube, E, and the hollow arms, F F, of a clothes drying frame, the invention of Mr. J. C. Dickey, of Washington City, D. C., and for which improvement a patent was granted on the third day of last month (June, 1851).

A A are legs supporting the spindle, B, by the flanges, C C, and bolts. The legs can be moved freely—folding them inwards to remove the frame at pleasure. The spindle is conical and inserted in the tube, E, which revolves freely on it. It has four hollow arms, F F. They are open at the lower edge. The sides of these arms project beyond the top and are perforated to receive the bolts, G G, which pass through them and through the arms, H H, which may be raised as shown by the dotted line, H. The arms are brought together when not in use, and when they are spread, the lower ends strike the centre, E, which sustains them in a proper position These arms are perforated, and a cord, I I, of proper size is threaded through them for the clothes to hang on.

This machine can be placed in any convenient position, and those who use it are relieved from re-adjusting the clothes. In winter, no person is required to wade through the snow to fix the clothes as it can be set on any walk. It is a frame convenient without being cumbersome, and labor-saving without being expensive. As it revolves with the wind, the clothes not only dry quicker, but escape the tear and wear of snapping so common to clothes on rigid lines.

Families may save the price of this machine in one year by the saving of the tear and wear of clothes. This frame is adapted for drying clothes, glue, fruits, &c. More information about State, county and other rights may be obtained by letter addressed to Mr. Dickey.

Curious Piece of Workmanship.

The Birmingham Journal says:—A singular illustration of the ductility and tenacity of iron, has been produced at the establishment of G. Downing, Esq, the Brown Iron Works, Smethwick. It is in the form of a book, the leaves of which are of iron, rolled so fine that they are no thicker than a piece of paper. The book is neatly bound in red morocco, and contains forty-four of these iron leaves, the whole being only the fifteenth of an inch thick. This curious book is the work of Charles Hood, who is in Mr. Downing's employment; it was rolled in the ordinary sheet iron rolls, and is a singular illustration of the tenacity of iron.

Mortality in our City.

On the week ending 12th July, there were 466 deaths in our city. Out of that number there were 205 below the age of one year. This shows that there must be something decidedly wrong either in the care or health of the parents.

Another Cure for Dysentery.

As this disease has been, and is very prevalent in many parts of our country, every thing which throws light upon the method of treating it is worthy of attention. We say this because there can be no universal cure, what will cure one will not another, but the number of suitable remedies may not be very numerous for all that. Along with the receipt of Dr. Reid, given last week, we present the following by a correspondent of the Baltimore Sun. The writer says:—

As the dysentery which is now prevailing is of a milignant type, it may be of some importance to call the attention of medical men to the beneficial influence of sulphate of quinia in this disease. In 1847 the writer of this used it in African dysentery, and in the last year in dysentery bordering on the tropics.

Conceiving there was some analogy between intertropical fever and dysentery, he believed that quinine might be used with as much efficacy in the one as in the other; and the result, so far as his experience went, induced him to consider quinine a most important medicine in the treatment of dysentery.

It may act by destroying a morbid state of the blood, or it may produce its beneficial effects by its anti-febric and anti-perodic power. Does it not act by decomposing the deleterious agency (whatever it may be) which, finding its way into the circulation engenders that combination of febrile action with intestinal inflammation, which is termed dysentery.

Of course, other remedies of known potency were not discarded. From 5 to 10 grains of quinine were given in solution of gum arabic thrice daily. Under its use there was a decided improvement."

For the Scientific American.

Astronomical Phenomena.

In No. 43 of the Scientific American, we find a notice of Humbolts communication to the "Berlin Academy of Sciences," describing some eccentric movements of Sirius when near the horizon. One clear evening last winter I noticed, with several others, a similar phenomenon as exhibited by the star Betelguese in Orion. My attention was called to it by some one of the family, mistaking it for a fire balloon, and, indeed, after noticing its swaying movements and flickering light, I was really in doubt whether it was a balloon or not, although aware it was in the same place in the heavens in which Betelguese should appear. We continued watching it for some time, but the higher it rose the less it exhibited its vagaries until after rising some 15° above the horizon it looked down upon us with its small steady stare. The explanation of its eccentricities seemed so perfectly obvious, I hardly thought it worth while to bring it before the scientific world. Every day we behold similar appearances. Look just past a heated stove pipe at any fixed body, the bars of the window for instance, and they will appear to waver and tremble like a spider web in the wind The continued motion of strata near the pipe differing in density, consequently in refractive power, must give a waving motion to all such bodies as send their rays to the eye through such moving strata. Now the earth is frequently of a different temperature than that of the surrounding air, and it will consequently throw it into vibrations precisely as the heated stove pipe does. The fact that stars never exhibit these anomalies except when near the horizon, is strongly in favor of the above explanation.

R. S. B.

Farmers College, July 17th.

New Observatory at Buffalo.

The Buffalo Commercial state sthat a new observatory is now in the process of erection near that city. It was projected by Dr. Van Duzee, of that city. The tower with its moveable dome is nearly finished. Henry Fitz, of this city, is now manufacturing the large refracting telescope, which will have a clear aperture of eight inches, and a focal distance of ten feet. Its motion will be regulated by clock work adjusted to siderial time. The observatory will also contain a transit instrument, right ascension and declination circles, comet seeker, and other instruments necessary to carry on a complete set of astronomical observations, all constructed in as perfect a manner as the present advanced state of the art will admit.

American Flour.

A friend of the "American Miller" says, "our flour is put up in inferior order," and this is the reason why our best qualities do not sell so well in Europe.

The "Night Blooming Ceres," the most magnificent of all the floral beauties, is now in bloom in many of the gardens in Cincinnati.

© 1851 SCIENTIFIC AMERICAN, INC.

To the Editor of the Scientific American.

SIR—Allow me a few words in reply to your strictures upon Sawyer & Gwynne's new Motive Power.

I beg to call your attention to a few points in which, it seems to me, that an incautious examination of the subject has led you into error. You affirm that Prof. Bull has committed a bull in his first answer. You say "the question is asked him how much power is required to give a certain weight a certain velocity, in a certain direction; and he says so many pounds. He might more intelligently have said one hundred and sixty-six potatoes. There is no power in mere weight; mechanical power is the weight multiplied into the velocity. Apart from velocity, one pound is just as great a power as one thousand." If I understand your criticism, it is that the element of velocity is wanting. The question which is replied to, which was before you when you wrote, and which you published, expressly asks for the power applied, necessary to bring a wheel of a given description from a state of rest up to "twenty-five revolutions in ten seconds." The velocity of the wheel to be revolved is not, therefore, wanting. It must then be the velocity of the weight applied that you feel the want of. But the known velocity of matter descending in vacuo which is always understood in such cases, is so well known that your books would enable you to supply the ellipsis. The ellipsis is likewise supplied in the description of the diagram No. 2. There is some question I am aware about the propriety of measuring power by weight, as a mere matter of the philosophical use of terms, but it is habitually done, nevertheless, and is entirely defensible by supplying a well understood elipsis. This, however, was not your difficulty. You say that the answer might better have been 166 potatoes. But, sir, 166 potatoes, unless they happen to weigh one pound a piece, will not give the motion in question, while 166 pounds will. Seriously, is there any practical mechanic, natural philosopher, or mathematician who does not distinctly understand the question? And is there any one who will not, if he applies his figures, answer it in precisely the same way? I think you will perceive that the supposed error lies solely in your own hasty reading. Do you not, on the principles of courtesy you inculcate towards men of science, owe an apology to Prof. Bull for unintentionally misrepresenting him? But all this belongs to the mere mechanics of the subject, and not to the philosophy, which underlies the mechanics. You are right, therefore, in hurrying forward to what is more fundamental.

2nd. In the next place you make yourself merry over the proposition that centrifugal force is an independent law of nature, as much so as gravity, exhibited though it be, only under the condition of rotation. Yet that is precisely what we assert, and I do not perceive that you have attempted any demonstration to the contrary. Your good humor, though exceedingly pleasant, is not argument. You think it necessary, if there be such a law, that we shall be able to tell where it comes from. You think you are able to tell where gravity comes from, and you do so by informing us that it is "a well known property belonging to all bodies"—that is, if I apprehend rightly that it is *in* bodies and that is where it comes from. In other words, it *is*, and that is why it is. By the assistance of such a formula you enable us to tell where centrifugal force comes from, which we could not do before: it is, and that is *why it is*. This, if you will reflect, is precisely what constitutes a primary law of nature. When we can get no farther back than to give, as the reason that a certain effect *is*, the fact that it is, we call that effect a law of nature. In other words, we cease to call it an effect, and denominate it a *cause*, which we do not seek to go behind. The term "a law of nature," is simply used as a convenient and decent way of announcing our ignorance. But you certainly make out some *differences* between gravity and centrifugal force. You say that gravity is "a well known property." I regret to say that much less is known about centrifugal force, but the world lives to learn, and the difference may, it is to be hoped, be reduced hereafter or finally extinguished. The other difference is, that gravity is a universal property of all bodies under all circumstances, while centrifugal force exhibits itself only under certain circumstances of motion. Very well, that would only make gravity a *universal* law of nature and centrifugal force not so. But we have never asserted that centrifugal force is a universa property or law of matter, we only assert that it is an *independent* law effecting bodies in rotation. Is it strange that a law of nature should only exhibit itself under certain conditions? How is it with electricity, magnetism, galvanism, &c.? Or, if we choose to question the universality of gravity itself, might we not ask you to show its effects upon light and the other imponderables?

3rd. You say, that, by the laws laid down by the natural philosophers, no body can give out a greater power than that impressed upon it, and give this statement as conclusive of the question. But we assert, as against all the natural philosophers, precisely the contrary, and give the simple phenomena of rotation to show that they are wrong. This, then, is the precise question at issue between us and the natural philosophers. You pronounce against us, not by an explanation of the phenomena which we urge, but by repeating what the natural philosophers have said.

4th. You call it the *reductio ad absurdum* that the direction in which a body moves should generate a force, but then your own account of centrifugal force is, that it is nothing more than "the rectilinear force bent out of its natural road *by the axis or centripetal force.*" How is that? Is centrifugal force, then, developed by a direction of motion? Do you yourself employ the *reductio ad absurdum* as a legitimate solution? If so, we may venture perhaps to adhere to it. But it occurs to me that the subject does not lie quite clearly in your own mind. You say, "those who have honestly believed that there was something in this alleged discovery, have been led into error by looking to the centripetal as the natural line of direction of the impressed power, instead of the centrifugal." But neither of these forces can, by any possibility, produce rotation of any kind or degree. I can hardly think, therefore that the error can have arisen from mistaking one for the other. It seems to me that the error is in confounding either with the force applied tangentially, or in the direction of the circle. While this simple error remains with you, it will confound all your reasonings on the subject, and render you quite incapable of understanding the position assumed by the friends of the newly observed facts in philosophy. I beg of you, therefore, that you will clear up your views upon the direction of a force applied to produce rotation as a preliminary condition to an intelligent discussion of the new principles. Centrifugal force acts in right lines radially from the centre to the circumference. Centripetal force acts in the same right lines, in the reverse direction, from the circumference to the centre. No amount of force applied in either of these directions, from now until doomsday, can ever cause the slightest amount of rotation, as you will not fail to perceive, your attention being now drawn to the consideration of the subject. It is not the theory of your authorities that the earth is propelled in its orbit by either centripetal or centrifugal force, or both of those forces combined, but simply that it is steadied on the track by the counterbalancing effect of those two forces. Please to re-examine this point of your own philosophy.

5th. You assert that centrifugal force is not *plus* the momentum, and that a body moving in a straight line has as much total force as a body moving in a circle. This is merely begging the question, to which you appear to me rather prone. We assert the contrary, and give in proof the fact that a wheel, in rotation, renders back *all* the force impressed upon it to cause rotation minus the friction, in its circular momentum, and that the centrifugal force is acting upon every particle of the wheel at the same moment, in a different direction that is, in radial lines outward, being frequently more than the momentum and increasing always in a higher ratio. Your appropriate answer would be to dispose of these facts, would it not? Do you mean to say that centrifugal force is a tax on rotation? If so, you are the first to make the discovery, and it is you who are the new discoverer and the butt of your own aim in your witticism against innovators. How much do you usually allow, in your practical mechanics, for the retardation of centrifugal force? Is it as much as that of friction or not so much? Is it as much as inertia? Is it usually measured and calculated as a retarding cause, to be allowed for in the construction? But if it is not a retarding cause, then, it is no tax upon the force applied to cause the rotation; and yet it is a force; and, notwithstanding your sneer, it is a *tremendous force*; as those know who have fought against its destructive energy in breaking up their machinery. Well, then, if it is a force in the wheel, costing nothing, using up nothing of the original power applied to rotate the wheel, then we return with the question—where does it come from? We think you have not answered that question, though you say you can. No theory about bending a line will do the work. We answer it, as you answer in relation to gravity: it is—and therefore it is. In other words it is an independent law of nature.

6th. But I come finally to what I think the most unfortunate of your errors, one that I regretted to see in a scientific journal. After admitting that centrifugal force increases in the ratio of the square, you then affirm that "the velocity is increased at the expense of an increase of power according to the square. To give a moving body a double velocity, it requires four times the original force impressed upon it; triple the velocity, nine times the force; this is a well-known law of mechanics." Hence, you add, "if the centrifugal force increases according to the square of the velocity, the velocity is increased at the expense of an increase of power, according to the square." I feel a good deal of delicacy in replying to this position. Such as it is, however, it is a position absolutely essential to your argument. If that fails, all fails. If it does not require four times the force applied to a wheel to revolve it with twice the rapidity, in the same length of time, then the centrifugal force does increase in a higher ratio than the force applied to produce the rotation, and nature does make a donation of power—for which we do not pay. But the position you have assumed cannot be maintained for an instant. The results are enormously absurd. Any practical man will put you right in relation to that, at once. If your positions were true the following would be the consequences, as applied to the simple process of turning a grindstone:—Assume that one pound of power (and I have explained what is meant by pounds of power) will revolve a grindstone once in one minute, we then require 4 pounds to give 2 revolutions in a minute, 16 pounds for 4 revolutions, 64 pounds for 8 revolutions, 256 pounds for 16 revolutions, 1,024 pounds for 32 revolutions, 4,336 pounds, 64 revolutions, 17,344 pounds for 128 revolutions, and 69,076 pounds for 256 revolutions.

STEPHEN PEARL ANDREWS.

REMARKS ON THE ABOVE—SUPPLYING THE ELYPSIS.—Let us present the question fairly, for we dislike the tergiversation exhibited in the foregoing article. Here is the original question—the basis of the deductions of the centrifugal philosophers.

NEW YORK, May 8, 1851.

RICHARD H. BULL, Professor of Mathematics: Dear Sir,—We take the liberty to submit for solution the following questions, and solicit your earliest reply. Very respectfully,

N. SAWYER, J. STUART GWYNNE.

We have a wheel weighing 531 pounds, the weight collected in a circle of 16 inches diameter: what amount of power, applied 1⅔ inches from the centre, will be required to cause it to revolve 25 times in 10 seconds.

Answer by Prof. R. H. Bull—166 pounds.

We repeat what we said about it before, without qualification. After we had published our previous comments, Prof. Bull called upon us to get a correction made; we asked what was the correction he wanted—"did he mean that his 166 lbs. had a certain velocity?" "No." "Did he mean the 166 lbs. passing through a certain space in ten seconds?" "No: the weight (166 lbs.) was a correct answer of the force required to produce the effect spoken of." If he had said, the 166 lbs. had a certain velocity, we would, for his own sake, have been happy to make the correction, but he came back next day and repeated his former assertions, with pungent pomposity. We shall now expose the fallacy of the answer of Prof. B., granting both premises to our opponents. If mere *weight* means force, and is a correct measure, then we have 166—531=—365 lbs. less than nothing to give the wheel 25 revolutions in the ten seconds. A pound of matter is understood by mechanical philosophers to be equal to 27.727 cubic inches of pure water at 60° Fah.: 166 lbs. of water, without any head—velocity—would not give a water-wheel of 531 lbs. one revolution in ten centuries. Every millwright knows this. Let us now try the correctness of the answer, by supplying the ellipsis furnished us by philosopher Andrews. This ellipsis is the velocity of matter descending in free space. Well, what is the velocity of 166 lbs. descending in free space during ten seconds? The velocity is according to the squares of the times. During the first second, a body falls through 16 feet (a little more than this, but no matter) of space; during the 2nd second, 64 feet, and at the end of the 10th second it will have passed through 1600 feet of space ($10^2 \times 16 = 1600 \div 10 = 160$); divided by 10, the seconds, gives us 166 lbs., having a velocity of 160 feet per second, which, if multiplied by 60, the seconds in one minute, and divided by 33,000, gives us 48 16-55 horse-power, the force of Prof. Bull to give the wheel of 531 lbs., 25 revolutions in ten seconds, ($166 \times 160 \times 60 \div 33{,}000 = 48\ 16\text{-}55$ horse-power). Gentlemen, you ought to feel ashamed of yourselves for taking so much power to revolve your wheel: we could make a stout boy do as much work. This new way of the centrifugal men for estimating the force required to move machinery, may be called the Bull System. We have only to state that a water-wheel of 6 horse-power will drive a run of 4½ feet of millstones (grinding wheat at that), with a velocity 146 revolutions per minute, to show how profoundly ignorant of practical mechanics the centrifugal force philosophers are.

SPLITTING THE CENTRIFUGAL FORCE PHILOSOPHERS' GRINDSTONE WITH A DOUBLE VELOCITY.—Having cut off the apex of the philosopher Andrews' obtuse angle, we will now remove the base. Let us turn to the 6th clause of his verbose article. Here, now, he thought he had nailed us with his nonsensical independent law of nature. We refer to our assertion about the centrifugal force being increased according to the square at the expense of a proportionate increase of power. If that fails, he says, all fails, and he says, "any practical man will put us right at once." Agreed: we accept the conditions; let a practical man decide who is right. Turn to page 13 "Bourne's Catechism of the Steam Engine," indisputable authority; it says, "the momentum is proportioned to the square of the velocity; of two balls of equal weight, but one moving twice as fast as the other, the faster ball has four times the momentum or mechanical force accumulated in it, that the slower ball has." Now, no dodging, philosopher Andrews, don't you feel somewhat delicate? You see it corroborates the very doctrine ($CV2^2=4$; $RV2^2=4$) which we presented in our comments, and which you considered as begging the question, but respecting which, we say, the above is a beggarly reply, and does not controvert a single one of the positions in it. It is a great pity that you did not commence to turn your grindstone with 48 horse power and thus complete your 256 revolutions with a new *tremendous force* indeed. We have answered you on the two main points, the rest of yours is mere gabble, and now, we say, there is no such a force in the universe as a centrifugal force, and we can prove it against all the centrifugal force philosophers whatever; they have yet to prove the existence of such a force.

© 1851 SCIENTIFIC AMERICAN, INC.

New Inventions.

Worcester's Clapboand Planing Machine.

Mr. E. D. Worcester, of Lockport, Niagara Co., N. Y., has invented and taken measures to secure a patent for a very excellent and new improvement in machinery for planing boards on both sides at once, and making them into clapboards and shingles, at one continuous operation. He employs the Bramah wheel cutters, which project out and cut beyond the edge of a shield which holds the board tight to the action of the cutters. The board is fed in edgewise, and there is a like arrangement of cutters on both sides. The board of this action, is reduced and planed on both sides to the requisite thickness. In connection with the planers, there are disc planes for trimming the edges. Behind all is placed a circular saw set in such a manner that it divides the boards in two halves lengthwise, by an oblique cut forming two clapboards planed on the outside.

The Partition Tumbler.

A new drinking glass has been introduced in England, which is used for effervescing draughts. By the ordinary method, the gas generated is so rapidly disengaged as to cause frequently a considerable waste. The partition tumbler obviates this difficulty. In one compartment is placed the acid, and in the other the carbonated alkali, which are then separately dissolved. On raising the tumbler to the mouth, the two mixtures meet over the partition, which is lower than the edge of the glass, and effervesence immediately ensues. This can be suspended at will by placing the tumbler upright, so that the whole or part of the draught may be taken as required.

Machine for Making Barrel Heads.

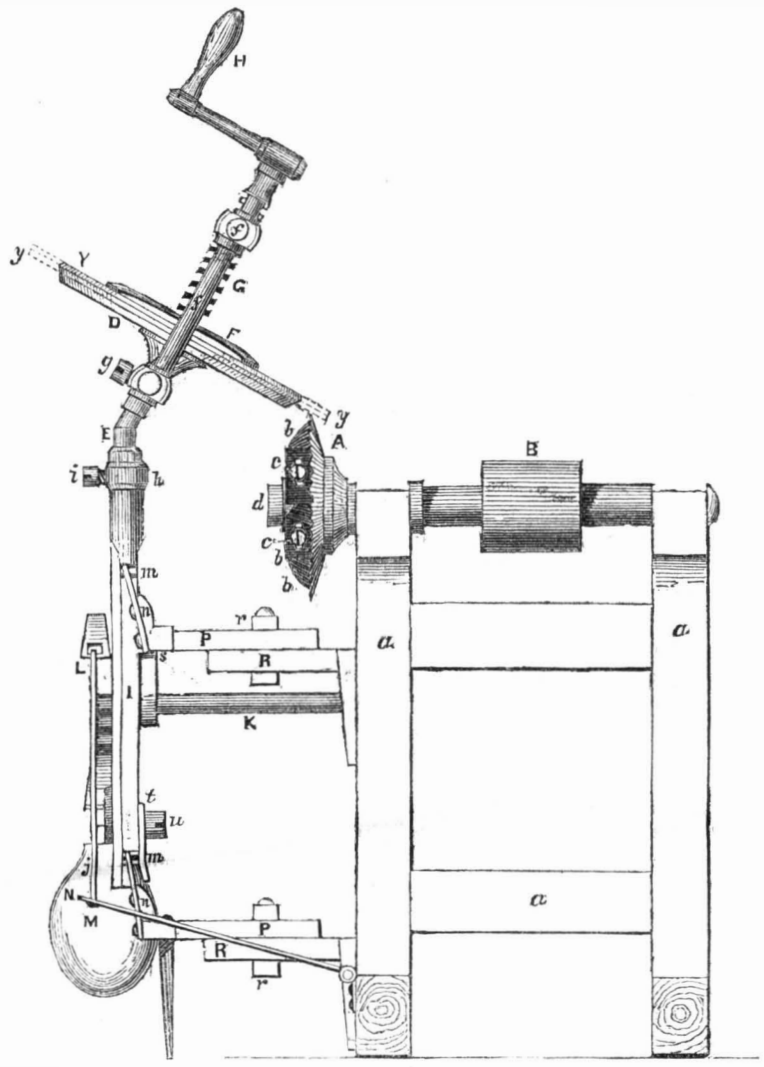
The accompanying engravings represent improvements in machinery for making barrel heads, invented by Mr. E. G. Brown, of Montville, Waldo Co., Maine, who has taken measures to secure a patent for the same.

Figure 1 is a side elevation; figure 2 is a front elevation. The same letters refer to like parts.

The nature of the invention consists in the employment of a concave circular saw carrying cutters on its inner face, which, combined, serve to cut the inner and outer bevel on the edge of the heads or pieces forming the same, —the head or pieces being fed up to the saw and cutters by an inclined disc or table attached to a slide having a vertical and forward motion, the heads being held to the disc by clamp, and turned by hand or otherwise, so as to present continuously its edge or edges to the cutting surfaces.

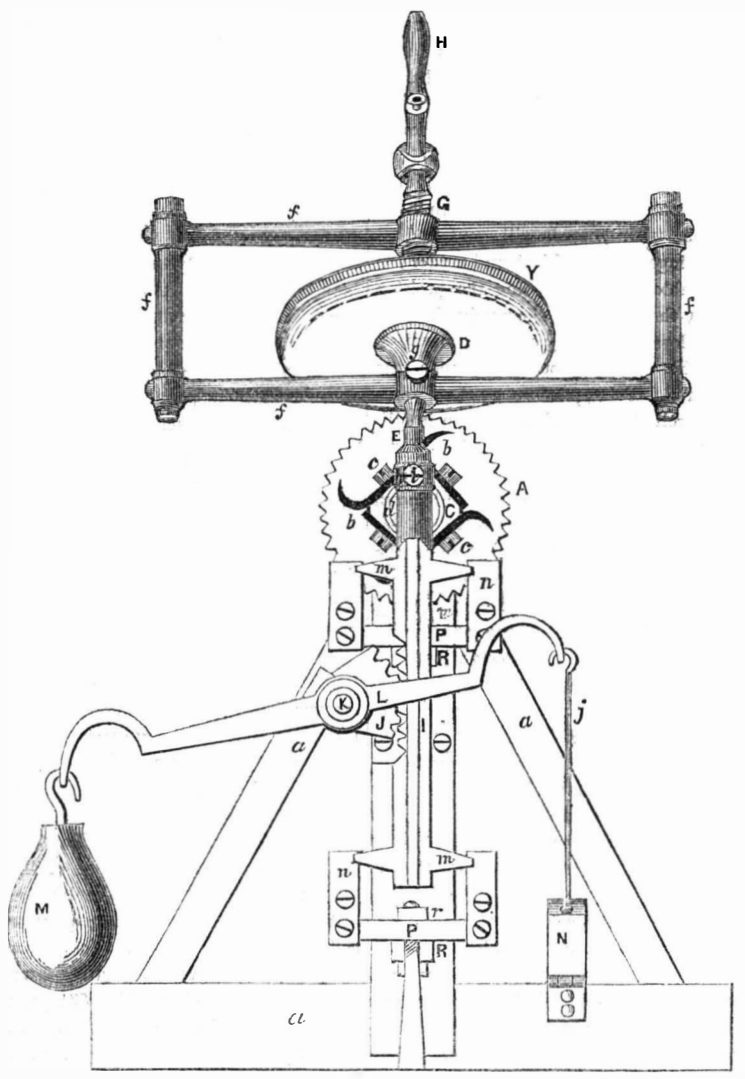
A is a concave circular saw with convex back, having any appropriate form of teeth; it is mounted on a horizontal shaft carrying a driving pulley, B, which is supported in the framing, *a a a*; *b b b* are cutters of suitable shape, secured to the block, C, (fig. 2) by set pins, *c c c*, the block, C, fitting on the shaft carrying the saw, and being held up against the inner (concave) face of the saw by the nut, *d*, the cutters, *b b b*, being made of an incline or bevel on their cutting extremities (fig. 1) so as to cut the one bevel on the head, also being made with and secured at their shank ends to the block, C, by slots through which the set pins, *c c c*, pass, holding them to the block, C, at any required distance and enabling them to be set in or out, according to the diameter of the cutting circle they are required to move in or describe. D is an inclined disc or table revolving on a spindle branching at the requisite angle from a vertical round sliding shank, E; it is made flat on its upper face, and with a bevel downwards on its edge, being situated in an inclined direction with relation to the saw, from, and as regards which it is set in front at any required position or distance. *f f f f* are rods forming, as united, an inclined oblong frame within which the disc, D, revolves, and which carries a revolving clamp, F, connected to the oblong frame by a screw, G, operated by handle, H the screw passing and working through the upper horizontal rod of the oblong frame, and being attached loose to the clamp, F, so as to admit of the clamp turning upon its end; it (the clamp, F) may be constructed of any suitable form for holding the head, or pieces constituting it, between it and the disc, D; it is here shown as being made with flexible arms, which are slightly curved downwards at their ends, so that when brought to bear hard upon

Figure 1.



the head or aforesaid pieces, they will slightly yield or straighten, owing to their flexibility, as caused by the pressure produced through the screw, G. The frame, *f f f f*, is secured

Figure 2.



and set on a collar uniting the spindle, *e*, and sliding shank, E, by a set pin, *g*, which admits of the frame being swung or turned upon the collar, also the sliding shank, E, fits into and slides in a socket, *h*, attached to and forming part of a vertical slide, I, the sliding shank, E, being held at its proper height in the socket, *h*, by a set pin, *i*. The slide, I, has teeth forming a rack on its one edge (as seen in figure 2) into which a part pinion or toothed quadrant, J, works for elevating or depressing the slide, I, as may be, the toothed quadrant, J, being attached to a shaft, K, turning in brackets secured to the framing and branch or branches therefrom, the shaft, K, and toothed quadrant being operated by a lever, L, on the one arm of which is a weight, M, pressing the slide upwards and so relieving the board from the cut, and the other arm being connected by a rod, *j*, with a treadle, N, which, in being depressed, draws down the slide, I, and by the attachments described, brings down also the board or pieces (held by the clamp, F, on the disc, D) to the saw, A, and cutters, *b b b*, the slide, I, by arms, *m m m m*, being made to receive, in addition to its vertical movement, a curvilinear forward motion through curved guides, *n n n n*, which the arms, *m m m m*, made with grooved ends, slide against or are guided by; the curved guides, *n n n n* are secured to arms projecting at right angles from or forming part of the sliding pieces, P P, which move over fixed pieces or branches, R R, attached to the front upright of the framing, *a a a a*; the pieces, R R, have slots in them in the direction of their length, which serve, through bolts, *r r*, to admit of the pieces, P P, being set in or out from the framing, *a a a*, and so setting the board or pieces under operation further from or nearer to the saw, D, and cutters, *b b b*; *s* is a stop fixed to the slide, I, which, by striking against the under surface of the upper piece, P, arrests the up stroke of the slide, and *t* is a further stop, secured by a set screw, *u*, which, fitting through a slot in the stop, *t*, secures the stop to the slide, I, whose down stroke the stop, *t*, thus adjusts and arrests by striking against the upper surface of the lower piece, P. Y represents a head or end, as finished by the machine, showing it held on the disc, D, by the clamp, F, and *y y* represent, in dotted outline, the board or pieces when first put into the machine for cutting out the head, Y; the operation, and further description, is as follows: a board of the breadth of *y y*, and of corresponding length, or strips having their edges adjoining and forming one piece, as if it were of the same dimensions as *y y*, is placed upon the disc, D, and held thereon by the clamp, F, operated as described. The saw, A, and cutters, *b b b*, are put in motion, and the foot applied to the treadle, N, which, through the slide, I, arms, *m m m m*, acting against the curved guides, *n n n n*, and other accompanying connecting parts as described, will cause the board or piece, *y y*, formed of strips, to be fed up to or against the saw and cutters, the curved guides giving the necessary forward or curvilinear direction (corresponding with the disc or concave shape of the saw) to the vertical motion downwards of the slide, I, and accompanying parts, so that the saw, in revolving, will cut out the board or piece, the head or end, forming it with an upper bevel, which it is enabled to do by reason of the disc, D, (holding the board or piece), being positioned on an incline in relation to the saw, of the necessary disc shape, as specified; the disc and clamp, together with the board or piece which they carry being turned by hand or otherwise, through the provisions described, until the saw has performed its operation of cutting out the head, which it fashions with an upper bevel on its edge, while the cutters, by reason of their inclined cutting edges, shape or cut the under bevel, which, when fitted to the cask, may be the upper bevel for fitting into the grooves in the staves forming the cask or barrel, as usual, more or less upper and under, or either bevel being given, as required, by varying the position or shape of the cutters, and setting the disc at any suitable inclination with relation to the saw, in connection with the several adjusting arrangements described, for altering the position of the slide and frame, which adjusting arrangements serve to admit of different sized discs being used, according to the diameter of the head required, also to vary the bevel and otherwise regulate or direct the cut.

This is a new and useful arrangement of machinery, and we are informed that it operates in a most favorable manner. More information may be obtained by letter addressed to Mr. Brown.

© 1851 SCIENTIFIC AMERICAN, INC.

Scientific American

NEW YORK, AUGUST 2, 1851.

To Patentees.---The Policy of Publishing your Inventions in the Scientific American.

If patentees were wise for themselves, they would get illustrated descriptions of their inventions published in our columns either before or at an early date after their patents are issued; the reason for doing so we will easily render obvious. The character of the Scientific American, as the best Repertory of American Inventions, is established, and those who are about engaging in a new business that requires machinery, and those also who wish new machines, examine our columns for the latest improvements. If the machine or machines they want be described there—and it is an easy way to get the information—they write to the owners of the patent, or the owner of the machine, and if the terms are reasonable they generally purchase. We also, have enquiries nearly every day about different kinds of machines; such as, ' where can I get the best mortising machine? where can I get a cheap and good pump? I wish to get the most approved machine for grinding ore; I wish to get a good and cheap steam engine," &c. We answer these questions by referring to engravings in our columns, or if the information wanted is not to be found there, we candidly give them all we can on the subject. The Scientific American is now in its sixth Volume, and will, in a few weeks, be in its seventh; and as its circulation is four times more now than it was three years ago, it follows that many are now subscribers who are not acquainted with the contents of our former volumes. From them we necessarily have more enquiries about machines than the old subscribers. Many have unwittingly invented and used patented machines which had been described by us years ago. They would not have done this had they been aware of the patents; they would rather have paid for their privileges. In such cases, both patentees and infringers are losers.

If we take into consideration that our population doubles itself in thirty years, a patent will, in the natural course of events, be nearly one half more valuable in its last than its first year; this is the reason why an American patent is of so much worth. Well, as our people spread so rapidly over such an extensive country, it is reasonable to conclude that many are now (and the number is fast increasing) using patented improvements without any knowledge of their being the subjects of patents. There are few who like to face a law suit for the infringement of a patent, but when a person has a machine in operation for some time, not knowing that it is patented, he is more ready to resist paying even a reasonable tax than he would be if he had known about the patent in the first place. Litigation is injurious to both sides, and we believe, in fact we know, that the patented machines which have been described in our paper have, in more instances than one, prevented law suits.

As the living and enduring testimony of an inventor's skill, the illustration of his invention published in our columns will go down to future generations, and surely this consideration ought to weigh somewhat heavily on the minds of patentees. A useful invention described in the Scientific American, is like a monumental statue; without such a remembrancer, without such a testimony to inventive skill, how many inventors have left their genius impressed upon the most useful of our machines, yet the names of those men are unknown in story—their handiworks go down to posterity, but the hands that fashioned them are "unwept, unhonored, and unsung."

Some may say, "we are speaking for ourselves,"—we truly are not disinterested, but whether you will hear or forbear, gentlemen, it is, and will be, our object and aim to make the Scientific American interesting and useful to men of scientific and mechanical tastes. In doing so, the benefits will be reciprocal, if you take our advice. You will be benefitted, our readers will be benefitted, and we will be benefitted; finally, if there be any reason or any hope in what we have said, we want you to think of these things.

Maryland Institute for the Promotion of the Mechanic Arts.

We have received the Circular of this respectable Institution, imparting the information that the Fourth Annual Exhibition will be opened in the city of Baltimore on Monday, the 20th day of next October. The Exhibition will be held in the new Hall of the Institute, now nearly finished: it is the finest Mechanics' Hall in America, and confers no small amount of honor upon the people of Baltimore. It is principally built of brick, 1,700,000 being used in its construction. The front and sides of the end on Baltimore street are of beautiful brown stone. The building is 355 feet in length, 60 wide, and 65 feet high. The large room is 265 by 60 feet, and will accommodate 6,000 persons. We would respectfully ask the attention of all engaged in industrial pursuits throughout our land to the circular of the managers. All are invited to compete for the prizes offered by the Institute. These consist of gold and silver medals for the male contributors, and a variety of fancy and useful articles for the ladies, as premiums to those whose handiwork may prove worthy of distinction. There were 16 gold medals, 90 silver ones, 60 diplomas, and 85 articles of jewelry awarded to the ladies by the Institute last year. The managers of this Institution have deservedly won for themselves, a high character for urbanity and impartiality. The gentlemen connected with this Institution are men of great respectability. It has 1,000 members, and along with the encouragement, or rather its object, "the promotion of the Mechanic Arts," the Institution proposes to establish a "Chemical School" upon a plan of Mr. Campbell Morfitt, a first rate analytic chemist, and author of that excellent work, "Morfitt's Applied Chemistry."

We give the Baltimore Mechanics double credit for this move. No man can be a finished engineer unless he is acquainted with chemistry. The mechanics of Baltimore enjoy a high character, and we must say they have gone far ahead of our mechanics in New York City in respect to their new Institution.

As we wish to be particular in giving all the necessary information about the Fair, we would say that there is a Standing Committee appointed, with whom intending exhibitors may communicate, post-paid. This committee consists of the following gentlemen:—Adam Denmead, Chairman; George R. Dodge, Thomas Trimble, Woodward Abrahams, Wm. A. Boyd, John F. Meredith, Charles Suter, C. W. Bentley; Samuel E. Rice, Secretary. Mr. John Selby, the Agent of the Institute, may also be addressed.

The hall will be open for the reception of goods, on Monday, 13th of October, and on the evening of the succeeding Monday, 20th October, at 7 o'clock, the exhibition will be formally opened for the reception of visitors. The exhibition will positively close on Wednesday night, 10th November.

The articles deposited for competition will be carefully examined by judges, selected for their capacity and impartiality; and in order to silence all suspicion of collusion, no judge, nor any member, either of the committee on exhibition or awards shall receive any premium whatever.

Contributors are assured, that the most scrupulous care will be bestowed by the managers, and particularly by the committee on exhibition, in displaying their productions to advantage, and in securing an impartial and judicious examination of them, both by the public and the judges.

The exhibition will be visited during its progress by the president of the United States, and Cabinet, His Excellency, the Governor of Md., and suite, His Honor, the Mayor, and the City Councils of Baltimore, and many other distinguished and official persons.

New Air-Gun.

A Mr. Arstale, of Birmingham, England, has invented an improvement on air guns by means of which from 150 to 200 bullets may be discharged in rapid succession, without other ammunition than a small reservoir of air carried by the "operator," attached by a gutta percha tube to the stock of the gun. The whole apparatus is lighter than a common musket, but it does not propel the bullets with the force of gunpowder.

A Pirated Invention at the World's Fair.

PATENT TURNING MACHINE.—We learn by the Lowell Advertiser, that a machine for turning thread bobbins, patented by J. & T. Coats, the celebrated thread manufacturers, Paisley, Scotland, is exhibited at the World's Fair, and has attracted a great deal of attention, even the particular attention of the Island Queen. Well it seems, after all, that it is an American invention, whether by a domociled Paisley body or not the Advertiser does not tell us. It seems that this Thomas Coats, sometime in 1841, was in Lowell, and had an opportunity of examining one of these machines in Douglass' bobbin factory, between the Carpet and Machine Shop. At his urgent solicitation Alexander Wright, Esq., the superintendent of the Carpet Mill, gave his permission, that a machine should be made for him, to carry to Scotland, on condition that a Mr. Clark, a friend of the superintendent's, in Scotland, should be allowed the privilege of making one of these machines for his own use. (Clark, the thread manufacturer of the same ilk, we suppose, and a fine fellow.) Well, what does Mr. Coats, canny Tommy Coats do, but file a caveat in London, after he went home; when applied to by Mr. Clark for a model, he refused to accommodate him, denying that the machine brought by him from America, was good for any thing. Mr. Clark having assurances from Mr. Wright, that the fact was otherwise, persisted in his demand, and finally commenced a legal process against Coats in order to obtain what had been denied him. In order to sustain his claim against Coats, Clark sent to Lowell for the deposition of Claud Wilson, overseer of repairs on carpet looms, through whose kind attentions Coats had been enabled to obtain the machine. Mr. Wilson's deposition was forwarded, and also another machine by Mr. Wright to Mr. Clark, in 1842. Mr. Clark thus obtaining a machine, probably felt no great inclination to push his lawsuit farther, and how it terminated precisely we have never ascertained.

"Our Lowell mechanics, says the Advertiser, especially Mr. Claud Wilson, an intelligent gentleman, himself from Scotland, are not a little amused, on perceiving Royalty itself imposed upon by an invention claimed by one of her own subjects, but which is really of American growth—the discovery of one their own number. It is almost time that the lion's skin should be stripped from this ass of an inventor and that he should be exhibited before the British public, dressed in no other *Coats* than those which rightfully belong to him."

Well, this is just the way with the world. There are men who would be really ashamed to be found telling a lie or stealing, who would think these things to be great crimes, but who would make no *bones* about stealing an invention or robbing another of scientific or literary fame. We like to show up such characters; and the way our people can show their appreciation of right and wrong, is to buy less of Coats' thread and more of Clark's, or why don't the Lowell folks go into the thread manufacture, they surely can get plenty of hands from the banks of the Cart to put up machinery and make as good thread as they do in Scotland.

Bomb Lance for Shooting Wales.

A very large assembly, says the New Bedford Mercury, was gathered at Fish Island yesterday to witness the experiments with Allen's whaling gun and patent bomb lance. Many of our merchants and captains were present. The lance was discharged from a gun weighing about twenty-four pounds, with the usual charge of powder, and was projected a distance of some forty yards, burying itself in the earth to a distance of some six feet, where it exploded, tearing up the ground in large masses. A further experiment was tried of throwing a lighted lance into the water, when it sunk to the bottom and exploded, showing that it can be used under water with equal success. The gun can be carried to the shoulder with ease. The opinion of the spectators was unanimous that the experiments were perfectly successful, and demonstrated beyond cavil the practicability of using these guns in the capture of the whale.

Patent Cases.

U. S. Circuit Court, Northern District New York, at Canandaigua, July 11th, 1851. Before Judge Nelson and a Jury.

Elisha Foote, vs. Horace Silsby, and others. This suit was for the infringement of a patent granted to Elisha Foote, of Seneca Falls, N. Y., on May 26th, 1841, for a Self-Regulating Stove. The defendants pleaded non-infringement denying that the patentee was the first and original inventor, that the invention was not new, that it was in public use before the patent was granted, and had been described in public works.

The following questions were submitted to the jury, viz:

"First question. Was the plaintiff the original and first inventor of the application of the expansive and contracting power of a metallic rod, by different degrees of heat, to open and close a damper which governs the admission of air into a stove in which it may be used, by which a more perfect control over the heat is obtained than can be by a damper in the flue?

"Second question. Was the plaintiff the original and first inventor of the combination described in his patent, by which the regulation of the heat of a stove in which it may be used is effected?

The jury in answer to each of said questions, responded in the negative.

On motion of the counsel for the plaintiff, the jurors were then polled by the clerk, and they severally answered that this was their verdict.

The plaintiff and defendants belong to Seneca Falls.

Colt's Pistol Case.

Col. Colt has an important suit now pending before Judge Woodbury, at Boston, under the patent laws, Leavitt & Co., having as he avers, infringed upon his patent repeating pistol. The case was adjourned from last Monday, the 21st inst., to the first of August.

Compound Rail of the Mount Savage Iron Works.

We are glad to learn, says the American Railroad Journal, from various quarters, that the subject of the use of the compound rail, manufactured at the Mount Savave Iron Works in Maryland, is attracting a great deal of attention, and that the proprietor, J. F. Winslow, Esq., of Troy, is engaged in filling large orders with American iron. All the experience of its use thus far gives entire satisfaction. It realises the great advantages predicted of it in the abstract, while at the same time the objections which are usually made to it are shown not to exist. The compound rail is as strong as the ordinary pattern of equal weight. If such is the fact, then the saving alone over the old track will in a very few years pay the first cost of the iron, to say nothing of increased speed, greater safety of passengers, etc.

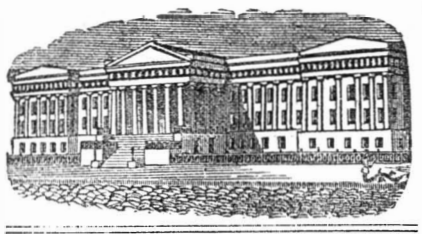
The above patern is now in use upon the Utica and Schenectady, Hudson River, Erie, Reading and some other roads, and has received the approbation of all the companies.

The Largest Steamer in the World.

The Eclipse, Capt. E. T. Sturgeon's new steamer, now on the stocks at Louisville, Ky., is to be three hundred and fifty-nine feet in length. She is to have eight of the largest boilers, and her water-wheel will be forty-two feet in diameter. She will be completed in the fall, and it is expected that she will make the trip from New Orleans to Louisville in four days.

Next week we will publish a splendid engraving of Barlow's New Planing Machine, and shall illustrate a number of other useful inventions.

© 1851 SCIENTIFIC AMERICAN, INC.



☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING JULY 22, 1851.

To J. J. Riddle, of Covington, Ky., for improvement in Brick Machines.

I claim the block or lip, substantially as described, hugging closely the mould wheel, immediately behind its point of contact with the pressure roller, in order to prevent any disturbance of the mass, after having passed the point of contact.

To G. H. Thatcher, of Albany N. Y. for improvement in combined fountain and operator.

I claim constructing a vase or other like article, with two apartments or chambers, having a continuous as well as a periodical communication with each other, by which it is rendered a self-supplying evaporating fountain, the continuous communication of the lower chamber with the upper apartment or evaporator, being effected by the pressure of steam upon the surface of the water in the lower chamber, and the periodical communication, by means of the valve secured in the screw nut, which will be opened by the pressure of the accumulated water in the upper apartment, when relieved of the pressure of the steam in the lower chamber, as fully described.

To J. V. Strait, of Litchfield, Ohio, for improvements in mode of changing reciprocating into rotary motion.

I claim, first, the employment of curved or inclined forks (four), having a reciprocating, rectilinear movement, operating on or operated by cams (three), in the manner and for the purposes herein set forth.

Second, the use of cams constructed or attached so that they may be turned or set, in order to produce a change in direction of the motion, and acting in connection with forks or their equivalents, substantially for the purposes described.

To John Jones, of Clyde, N. Y., for improvement in hanging carriage bodies.

I claim the manner herein described of raising the body on to the springs, or lowering it on to the reaches, as may be desired and for the purposes set forth.

To Wm. & Wm H. Lewis, of New York, N. Y., for improvement in Buffing Apparatus for Daguerreotype Plates.

We do not claim heating the buffer, as that has been done by lamps operating on the plate on which the buffing material is stretched, but in that form the heat is uneven, and the vapor from the spirit lamp is liable to come in contact with the buffing material. But we claim the enclosing drum, constructed with the sliding segment or cover, flanch, and lip sliding in the grooved plate and retained by the spring for the purposes specified, in combination with the drum and pipe to pass the heat from a spirit lamp or other heater to the drum, for the purpose of heating the buffer; the drum being fitted with a pipe, or other means, for passing vapor from the spirit lamp, outside the case enclosing the buffer, substantially as described.

To John Jones, of Clyde, N.Y., for improvements in hanging Carriage Bodies.

I claim, first, the combination herein described, of the turning compensating plate, with the rock shaft and the connecting rods, for the purpose of equalizing the action on the helical spring.

Second, I claim the stop lever in combination with the turning plate used in fastening down the body, substantially in the manner described.

Third, I claim the stays for the purpose of keeping the axletrees in their true set or upright position, as described.

To C. W. Stearns, of Springfield, Mass., for improvement in Faucets.

I claim the application of a hollow conical packing around the waist of the valve stem, in combination with an open space between its lower end and the stem, the interior of the tubular projection being smooth, or of such form as to allow a tight joint between it and the conical packing, substantially as described.

To J. A. Lawrence, (assignor to Roberts & Lampson), of New Haven, Ct., for improvement in Saddletrees for Harness.

I do not claim the yoke, the terrett, or the pad iron, separate from each other, but I claim the combination and arrangement of the yoke, the terrett and the pad iron, in such manner that the pad iron may be adjusted at any angle required for use, and immediately secured firmly in its place, by a screw on the terrett-iron passing through the yoke into the pad iron, substantially as set forth.

To J. F. Flanders, of Newburyport, Mass., for improvement in Pumps for raising water, &c.

I claim the rod, H, and its arms, or other equivalent contrivances, and its valve collar, as applied or combined with the rod, F, of the lower box, and the valve or valves made to operate therewith, substantially as set forth.

To D. R. Ambrese, of Portsmouth, N. H., & O. L. Reynolds, of Dover, N. H., for improvement in Cloth-dressing Machines.

We claim, first, the measuring and folding of cloth, paper, and other articles, by means of two revolving cylinders, each of which is provided with a tongue and jaws, the tongue to feed the cloth into the jaws, which seize it and form the fold, and deliver it upon the table, leaving it properly measured and folded.

To Samuel Cook, of Adam's Basin, N. Y., for improvement in Flour Bolts.

I claim the combination and arrangement of the inclined boards, with a case of graduated screens, constructed and arranged substantially as described and for the purpose set forth.

To N. A. Boynton, of Boston, Mass., for improvement in Parlor Cooking Stoves.

I claim the arrangement of flues, as herein above described about the oven of a parlor cooking stove, by which the heat, smoke, &c., is first made to pass over the top of the oven, and then down the passage formed between the front side plate and the side of the oven, across the bottom, up through the passage formed between the rear side plate and the other side of the oven, and finally out through the smoke pipe, the heat, &c., being made to pass to the part of the oven most remote from the fire chamber, by partitions (four) on the top and bottom of said oven, substantially as described.

To S. A. Bantz & Wm. Andrew, of Frederick, Md., for improvements in Mills for Grinding Corn and Cobs.

We claim the chopping and feeding apparatus, constructed and operating as herein described, in connection with a grinding apparatus, as described, in connection with a grinding apparatus.

We also claim the recess in the concave, which prevents the escape of fragments when struck by the teeth of the cylinder.

To M. G. Hubbard, of Rochester, N. Y., for improvements in Carriage Springs.

I claim the combination of the rockers and spring bars of a carriage, substantially as set forth, and for the purposes described.

To Wm. Hawkins, of Milwaukie, Wis., for improvements in Stave-dressing Machines.

I claim the arrangement for starting each stave or introducing it to the feed, at the proper moment, consisting of the wheel with its stud, the bent lever, the pitman, two levers, shaft, sliding rod, spring, and adjustable starting bar, in combination with the apparatus for giving the reciprocating motion to the jointing cutters, so that the greatest width of the stave may be given on different lengths of staves, uniformly at the middle, or such other point as may be desired, the whole being combined, arranged, and operated in the manner substantially as specified.

To Joseph Burgess, of Leicester, Mass., for improved machine for dressing Boot Forms.

I claim the circular motion of the cutters attached to one end of a lever, the other end being so confined on the opposite side of the boot form, as to allow the cutters to play up and down, and dress one or both sides of a boot form at a time, as set forth.

To Jacob Jenkins, of Andover, Mass., for improvement in Feather Edging Gauges for Shoemakers.

I claim the adjustable gauge rest, the pressure roller and knife, or cutter, in the case or handle, substantially as described, and so as to constitute a tool for feather edging or reducing soles of shoes, as specified.

To S. W. Kirk, of Coatesville, Pa., for improvement in Bran Dusters.

I do not claim, exclusively the employment of intermediate vanes, acting in connection with the brushes on the reel for forming a blast, as such has already been used; but I claim the employment of adjustable vanes, which may be set in or out, and obliquely in the direction of their length; or be set either way only, as described, by the vanes, such adjustable vanes acting in combination with the brushes on the reel, for the purposes and in the manner substantially as set forth.

To Reuben Shaler, of Madison, Conn., for improvement in Dyeing Door Mats.

The coloring of borders and figures in a variety of colors and forms, upon the wool of lamb skins and sheep skins for mats and other similar purposes, by the use of pans (which are to contain the dyes), being made and shaped in the form of the borders or figures designed to be closed, in combination with the matching tin or form, or an equivalent device for parting the wool, substantially in the manner and for the purpose set forth.

To Wm. R. Jones, of Granville, N. Y., for improvement in machines for preparing hubs for boxes

I claim the combination of the movable cutters with the saws and small pins arranged and operating substantially in the manner and for the purpose described.

I do not claim the cutter singly, or the arbor, or disc, or the saw, such things having been used separately before.

DESIGNS.

To H. K. Flinchbaugh, of Konestoga, Pa., for design for Cast-iron Tomb.

For the Scientific American.

Electric Action.--Steam Boiler Incrustations.

In the Scientific American of the 12th inst., I find the announcement of an English patent for the prevention of Incrustation in Boilers, by employing zinc plates in them; and the explanation given is, that "the zinc is more oxidizable than the iron, so the latter is protected from incrustation, while the former oxidizes."

You do not like the plan, as it would be cheaper to get a copper boiler at once. I also do not like the plan, but from a very different reason, viz., that the process of incrustation will be the very reverse of what is claimed. The principles of electro-chemistry, as I understand them, are, that when metals stand to each other in the relation of *anode* and *cathode*, in contact with an *electrolyte* containing in solution any salt, *electrolysis* results, and the base of the salt is deposited on the *cathode*.

The various operations of Electro-Gilding and Electro-Metallurgy, depend on this law of Electro-Chemistry.

I have analyzed many specimens of "scale" from marine boilers, and find them composed almost entirely of sulphate of lime, yet very different in appearance and hardness, from sulphate of lime in any other form, that I have ever seen. That this incrustation is the result of galvanic action I have no doubt; I believe the calcium to be deposited on the electro-negative metal, in a metallic state, but on account of its peculiar affinities, it immediately becomes an oxyde, and then a sulphate, by causing a decomposition of the sulphates in solution in the boiler; these changes taking place, apparently, instantaneously, but actually requiring some duration of time. Make a solution of a salt of any metal, place in it a plate of iron and also one of zinc, the deposit of metal from the solution will (provided decomposition takes place) invariably be on the iron, or, as Faraday terms it, the *cathode*.

These principles are well known to electrotypists, and there will be no exception to them when precisely a similar action takes place in a steam boiler. If the English patentee had used copper instead of zinc, there would have been some reason in his reasoning, as copper is electro-negative to iron in a solution of sea water, and while the surface of the iron boiler would be acted upon in proportion to the amount of copper surface, it would remain free from scale, and all the scale would be deposited on the copper. These plates of copper should be so inserted as to be taken out and cleaned, whenever necessary. I once saw a cold chisel, which had been left by the workmen in one of the Mississippi (copper) boilers, and had been there during a long cruise in the Gulf of Mexico, taken out, partially corroded it is true, as might have been expected, but entirely free from scale, while the boiler was very badly incrusted. I have seen copper feed-pipes to iron boilers become choked up with scale, while iron pipes, would remain clear.

I have seen the copper of steamer's bottoms clean, except opposite the wheels where they were very foul. And I was always satisfied of the reason, and wherever I have known two metals in proximity, one of which was more readily dissolved by the medium in which they were placed, than the other, I have never known an exception to the above described laws of electrolytics; hence I do not believe in any exceptions to the laws of nature, to accommodate Mr. Babington or any one else.

I have hastily thrown together what I believe to be true reasons and remedies for incrustation, and submit them to you, not with any request or wish for their publication, but should they seem rational and sound, to you, I may write out in full my ideas of the various complicated changes which take place in the forms of matter, especially inside of steam boilers. I have given the subject several years of close investigation, as I think it one of vast importance. I am, respectfully,

N. B. Webster.

Portsmouth, Va.

For the Scientific American.

Causes of Intermitting Springs and Geysers.

When, in a hilly or mountainous country, there is a cavity under ground surrounded by solid rock, stiff clay, or hard pan, which has no horizontal or downward opening, but whose opening is a narrow channel, first bending upwards and then downwards, the downard arm being longest, and into which cavity water is infiltrated from above; then, when this cavity is filled with water to a level with the highest ascent of the curved channel, this channel will act as a syphon; and, if this syphon carries off water faster than it accumulates, there will be an intermitting spring at its lower external opening which will flow so long as there is any water within reach of the short arm of the syphon, and when this is exhausted, the spring will become and remain dry till the water again accumulates in the cavity or fountain to the height of the highest curve of the syphon, and the process of emptying the cavity will be repeated.

Again: if there be such a cavity whose external opening or openings lead upwards, and which has an internal channel leading into a volcanic furnace; then, when the water accumulates in this cavity till it overflows into the furnace, where it is converted into steam, this steam will rush into the cavity or reservoir, heat the water there, and, when the steam is no longer condensed, it will press on the water in the cavity, and by its expansive force drive the water upwards in a jet to the height of ninety feet, more or less, as in the great Geyser of Ice and, which is a mountainous volcanic country. Now, this last is all my own supposition, the subject does not admit of exploration; but it is the most rational explanation of the cause of the Geyser I have seen, and Geysers must have a cause as well as everything else. May not the phenomena of volcanoes and earthquakes be accounted for on somewhat analogous principles, especially their intermitting; for, if water be conveyed to the furnace by a syphon, or upward channel, and nearly or quite all driven out of the reservoir by the expansive power of steam upon it, the eruption must of necessity intermit till water accumulates, and is supplied to the furnace again.

H. R. S.

© 1851 SCIENTIFIC AMERICAN, INC.

TO CORRESPONDENTS.

D. F. P., of La.—Much obliged for the large list of subscribers forwarded by you: the names have been entered to commence with the new volume, which, we suppose, will better please the majority of the party than to have their subscriptions commence now The next volume will be far beteerthan the present, notwithstanding you esteem this year's so valuable.

J. E. A., of Ct.—A patent was granted to J. E. Larkin, of this State, on Auger Handles, last year, which embraces the same principle as the one you represent, although the construction is slightly different. See engraving of Auger Handle on page 388, Vol. 5, Sci. Am.

P. O. & Co., of N. Y.—We cannot enter the name of any individual upon our subscription bocks unless the amount of subscription is paid in advance. You cannot make an application for a patent as assignee of a foreigner: the application must be made in the name of the inventor, and, in your case, the full English fees paid ($500).

D. E. R., of Rochester, N. Y.—The orifice of the safety-valve is made about 0·8 of a circular inch per horse-power for a condensing engine, and 1 1-4 of an inch per horse-power for a high pressure. This is the simplest rule we can give you, and is the answer you want, as we understand by your letter.

J. R., of ——.—If we can we will get you the information requested.

S. W. K., of Pa.—We have received your letter, and we wish you great prosperity, you deserve it.

G. F. J., of N. J.—We will give yours attention next week.

H. S., of New York.—Yours next week: it will come in good time.

J. C., of New York.—The great objection against your cast-iron blinds is their weight and great price. The latter is no objection against their merits, but it would prevent, we think, an extensive sale. The Patent Office, in all likelihood, would not grant a patent as it would be said they are only of a different materials.

W. W. R., of N. Y.—Yours next week.

J. P. P., of N. C.—Abner Lane, of Killingworth, Ct., has a patent for a machine for turning irregular forms; also Allen Goodman, of Dana, Mass., manufactures a machine for that purpose. The Blanchard machine, of course, you know about.

J. B., of Ky.—We have sent your communication to the inventor, who will reply more fully to your enquiries than we are able to. Mr. Hutchinson's stave machine is undoubtedly the best one you could possibly get.

C. H. P., of R. I.—You can build a carriage after the plan of Adam's Patent without infringing upon Everett's. If the two arrangements are alike, Everett's patent would be of no value to him when brought to the test of law. The one your refer to we had never noticed.

J. S., of Mass.—We do not think you will be able to obtain a patent for your alleged improvement in brakes. Some time since a model was exhibited to us substantially the same as yours, and upon which the inventor made no claim. In the rejected application filed by Wm. Hall, essentially the same contrivance was employed. We cannot advise you to make an application.

J. W. C., of Ind.—We think Mr. G.'s contrivance to be somewhat different from yours. Our opinion is that he will scarcely realize the amount he has paid for the patent. We still advise you to let the matter rest where it now is. You cannot get the patent claims for 1847, that we know of.

J. S., of N. C.—The engine and boiler, concerning which you wrote to us has been sold.

L. A. S., of N. Y.—Your letter containing a draft for $23 came duly to hand. We have watched daily for the model you mentioned as having sent, but it has not come yet.

Money received on account of Patent Office business since July 21:

J. H. S., of N. Y., $30; L. P., of N. Y., $20; W. P., of N. Y., $20; W. H. B, of R. I., $30; E. P. C., of Pa., $32; A. C., of Ct., $15; J. L. H., of N. Y., $20; W. H. C., of Miss., $12; R. H. S., of Mich., $25; W. C. B., of N. Y., $60; S. I., of N. Y., $20; W. R., of Mass., $32; J. M. C., of Me., $25.

Specifications and drawings of inventions belonging to parties with the following initials, were forwarded from this office to the Patent Office from June 24 to July 21:—

M. S. C., of Ct.; L. P., of N. Y.; T. B. R., of Mass.; T. M. C., of Me.; A. C., of Ct; D. H. T., of Mass.; L. R. B., of Ct.; J. L. H., of N. Y.; J. H., of Texas; E. P. C., of Pa.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2, and 3—none.

Of Volume 4, about 20 Nos., price 50 cts.

Of Volume 5, all, price, in sheets, $2; bound, $2,75.

Of Volume 6, all back Nos., at subscription price

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

ADVERTISEMENTS.

Terms of Advertising:

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them at any price.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents. In the item of charges alone, parties having business to transact abroad, will find it for their interest to consult with us, in preference to any other concern.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

INDUSTRIAL EXHIBITION.—The "Maryland Institute for the Promotion of the Mechanic Arts," will hold its Fourth Annual Exhibition of American Manufactures, Machinery, &c., in the splendid new Hall, now being finished at Baltimore, from 20th Oct. to 18th Nov. next. Mechanics, manfacturers, and others are cordially invited to deposite specimens of their best productions, in competitions for the Gold and Silver Medals, Diplomas, etc. Steam power, labor, &c., is offered free to despositors. Great care will be taken that fair play shall be shown to all the exhibitors. Those desiring to deposite articles are required to notify the Committee at once, stating the nature of the goods, and the probable amount of room required to display them to advantage. Circulars containing full particulars, rules, &c., with a view of the Institute's New Hall), may be had by addressing the Agent, J. S. Selby, or the undersigned, who will promptly give any other information to those who desire it. See editorial columns of Sci. Am, of Aug 2, 1851. ADAM DENMEAD,
46 5 Chairman Com. on Ex.

1851 TO 1856—WOODWORTH'S PATENT PLANING, TONGUEING, AND GROOVING MACHINE.—Ninety-six hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Patent Machines. Price of the machines from $150 to $800. For rights in the unoccupied Counties and towns of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 46 4*

A. B. WILSON'S SEWING MACHINE—Justly allowed to be the cheapest and best now in use, patented Nov. 12, 1850, can be seen on exhibition at 195 and 197 Broadway, (formerly the Franklin House), room 23, third floor, N. Y. Rights for territory or machines can be had by applying to GEO. R. CHITTENDEN. 46 2*

MILLWRIGHT AND MACHINIST.—The undersigned begs leave to draw the attention of all who may have occasion to use machinery to his new and extensive arrangements for furnishing Steam Engines and Boilers of various sizes, mill gearing and wrought-iron Shafting; Log, Circular, Veneer, Scroll, and Slitting Saws, and other machinery connected with a manufacturing establishment, upon the most favorable terms at his works, corner Eleventh avenue and West 29th st. THOS. J. WELLS. 46 4*

WANTED IMMEDIATELY---To go South, one smith, two pattern makers, and one finisher, who must not only be good workmen but possess qualifications which belong to gentlemen, they must be temperate, honest, and faithful. To such, permanent employment and good wages will be given. For particulars, address, post-paid, MUNN & CO., at this office immediately. 46, tf

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th, 1,—1850, is, without doubt, the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber, and so great was the favor in which this machine was held at the last Fair of the American Institute, that an unbought premium was awarded it in preference to any other on exhibition. Persons wishing for rights can address, (post-paid) JAMES D. JOHNSON, Easton, Conn., or Wm. WOOD, Westport, Ct. All letters will be promptly attended to. 37tf

IMPORTANT NOTICE.—The subscribers, owners of A. B. Wilson's Sewing Machine, patented Nov 12, 1850, now offer for sale the following States and Territories:—Vermont, New Hampshire, Virginia, Indiana, Wisconsin, Kentucky, Iowa, Oregon, Florida, California, Louisiana, Ohio, Arkansas, Delaware, and Minesota and Deseret: any of the above territory will be sold to suit purchasers, with or without machines. Any communications addressed (post-paid) to E. E. Lee, Earl's Hotel, New York City, will receive prompt attention. E. E. LEE,
45 2* ROYAL BALL.

FOR SALE—One 41-2 feet Iron Planer, weighing 1,700 lbs., a good machine. Also second-hand Engine Lathes—one a screw lathe. Apply to ELI WHITNEY, New Haven, Ct. 42 6*

STOP THIEF.---All editors are requested to pass the scoundrel round. The public are cautioned against a pirate who stole the Model of a Match Splint Machine invented and patented by me on the 29th of April, 1851. The said person is trying to sell my machine under secrecy and pretence that it is his own. He being irresponsible and not to be believed, I would advise all to beware of him. I will hold all persons who may purchase the right of this machine from him responsible for the payment. L. L. GILLILAND.
Dayton, O., July 10, 1851. 45 4*

AARON KILBORN, No. 4 Howard street, New Haven, has on hand, and is now finishing, five 14 horse-power engines; price, including boiler and all fixtures, $1200; twelve of from 12 to 6 horse-power, all of the most approved patterns, iron bed frame and pulley balance wheel. Galvanized Chain, and fixtures for chain pumps always on hand and for sale. 45 10*

MECHANICS' FAIR.—The Middlesex Mechanic's Association will open their first exhibition for the encouragement of the mechanic arts and manufactures in the city of Lowell, on Tuesday, Sept. 16, 1851. The Committee of Arrangements for this proposed Fair, respectfully invite and solicit all persons engaged in the various branches of mechanism, manufactures, science, and art, to present specimens of their various products for exhibition and premium. Ladies are cordially invited to present specimens of their ingenuity and taste. Preminms will be awarded as the articles presented may merit. Articles for exhibition should be sent on or before Sept. 10th. For more particular information or copies of the circular, address (post-paid) J. A. Beard, Esq., Supt., Lowell, Mass. By order, OLIVER M. WHIPPLE, Chairman.
M. C. BRYANT, Sec'y. 40 10

LEONARD'S MACHINERY DEPOT, 109 Pearl st. 60 Beaver, N. Y.—The subscriber is constantly receiving, and offers for sale, a great variety of articles connected with the mechanical and manufacturing interest, viz., Machinists' Tools—engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, bolt cutters, slide rests, universal chucks, &c. Carpenters' Tools- mortising and tennoning machines, wood planing machines, &c. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing,—wrought iron shafting, brass and iron castings made to order. Cotton and Woolen Machinery furnished from the best makers. Cotton Gins, hand and power, and power presses. Leather Banding of all widths, made in a superior manner, from the best oak tanned leather, Manufacturers' Findings of every description—bobbins, reeds, shuttles, temples, pickers, card clothing, roller cloth, potato and wheat starch, oils, &c. P. A. LEONARD. 33tf.

PATENT CAR AXLE LATHE.—I am now manufacturing and have for sale the above lathes: they will turn and finish six sets per day, weight 5,000 lbs., price $600. I have also for sale my Patent Engine Screw Lathe, for turning and chucking tapers, cutting screws, and all kinds of common job work; weight 1500 lbs., price $225, if the above lathes do not give good satisfaction, the money will be refunded on the return of the lathe, if within six months. J. D. WHITE,
32 13* Hartford, Conn.

GREAT REDUCTION IN PRICE.—The most valuable book of the day, containing domestic and medical recipes, rules with regard to the recovery and preservation of health, an account of the different medical theories of the day, useful tables, &c., entitled "THE GRAEFENBERG MANUAL OF HEALTH." It is complete in one volume of seven parts, and is beautifully printed upon fine paper, in a convenient form of 300 pages. The immense success which has attended the sale of previous editions, has warranted a reduction in the price of this (the 7th) edition, from 50 to 25 cts. per copy. Any number of copies, from one upward, will be forwarded upon the receipt of the money, (post-paid). Address THE GRAEFENBERG COMPANY, 214 Broadway, N.Y., or this Office. 38tf

BRICK-MAKER WANTED.—I am desirous of obtaining a foreman for an extensive brick-yard: it will be necessary that he be a sober industrious man, a practical brick-maker, fully competent to superintend the work of 40 men; to such a person a salary of $500 a year would be given; situation permanent, upon good behavior. Address A. MILLER, Raleigh, Canada West. 43 4

MONTGOMERY MANUFACTURING CO'S Iron Works, Montgomery Ala. Capital invested, $250,000. Steam Engines and Boilers, Reuben Rich's cast-iron centre vent water wheel and iron scrolls complete (the very best wheel in use), sugar mills, saw and grist mill irons of most approved patterns, iron and brass castings of every variety, &c. Orders promptly executed, and upon terms as favorable as can be secured from the best northern establishments. When required, deliveries made (through their agents) at Mobile or New Orleans. Address GINDRAT & CO., Agents. 42 3m

MORTISING MACHINE.—Dear Sirs: I received the Portable Mortising Machine about 3 weeks ago: I have used it, and am very well pleased with it. It is the best plan of a machine of the kind I have ever seen. W. R. McFARLAND.
Nashville, Tenn., June 22, 1851.
The above machines are for sale by MUNN & CO., price $20—boxed and shipped. 42 tf

BOGARDUS'S CELEBRATED HORSE-POWER.—Cranks, balance wheels, pitmans or noddle-heads, stirrups, feed hands, saw gate slides and rods, wrag wheels, carriage cogs, dogs, gudgeons, mill bars, saw gummers, and Hotchkiss wheels and shafting for saw mills; spindles, bales, drivers, hoisting screw and bales, regulating screws, mill pecks, bushes, smut machines, shafting and gearing iron water wheels for flouring mills; fly or roll bars and plates, paper cutters, Kay's callendaring apparatus for continuous sheets for paper mills; screws for lathes and presses, jack screws, wrought and cast iron shafting, pullies and hangers, heavy forging, cotton gin gear, screw-bolts and nuts, slip gudgeons are manufactured at the Speedwell Iron Works, Morris Town, N. J. Office in New York, No. 9 Gold st., with Logan, Vail & Co. P. S. Belting and bolting cloths supplied to order. GEO. VAIL & CO.
28 1amtf

TO TIN PLATE AND SHEET IRON WORKERS.---ROYS & WILCOX, Mattabesett Works, East Berlin Station, on the Middletown Rail Road, manufacture all kinds of Tools and Machines of the best quality, both in material and workmanship. This establishment being the only one where both tools and machines are manufactured, superior inducements are offered to the trade; all work warranted, with fair use. Agents in most of the principal cities of the United States and Canada. Orders promptly attended to. F. ROYS,
E. WILCOX.
Berlin, Conn., Nov. 1, 1850. 7 1amly

WANTED.—A situation is wanted by a person capable of planning and constructing furnaces for smelting iron ore, or erecting rolling mills. He is an experienced mechanic, thoroughly conversant with the iron business, and would like a permanent situation in some of the Southern States. Address M. E., Dover, N. J. 45 10*

LAW'S PLANER FOR PLANK, BOARDS, &c., is now attracting much attention on account of its effectiveness, the excellence of its work, its simplicity, and consequent economy. Machines are now in operation in Brooklyn, New York City, and at various points South and West. Rights or machines for sale by H. LAW, 23 Park Row. 45 tf

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions: Washington Factory, Newark, N. J. 38 13*

A CARD.—The undersigned beg leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton st. 42 3m*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
25tf No. 66 Beaver st., New York City.

BEARDSLEE'S PATENT PLANING MAchine, for Planing, Tonguing, and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine Shop and Foundry of Messrs. F. & T. Townsend, Albany, N. Y., where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry, or at his residence, No. 764 Broadway, Albany. GEO. W. BEARDSLEE. 43tf

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
QUARTERMAN & SON,
35tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines Dick's Presses, Punches, and Shears; Mortising and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 38tf

IRON FOUNDERS MATERIALS—viz., fine ground and Bolted Sea Coal, Charcoal, Lehigh, Soapstone, and Black Lead Facing. Iron and brass moulding Sand; Fire Clay, Fire Sand, and Kaolin; also English, Scotch, and Welsh Fire Bricks—plain, arch, circh, circular, and tower cupola, for sale by G. O. ROBERTSON, Liberty Place, between 57 and 59 Liberty st., (near the Post Office), N. Y. 44 12*

RAILROAD CAR MANUFACTORY.--TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
39tf. THOMAS J. FALES.

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

LATHES FOR BROOM HANDLES, Etc. We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles, and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
At this Office.

WOODWORTH'S PLANING MACHINE. For sale, the right to use this justly celebrated labor-saving machine in the following States, viz.: Pennsylvania west of the Allegheny Mountains, Virginia west of the Blue Ridge, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Alabama, and Mississippi. For particulars apply to the Proprietor, ELISHA BLOOMER, 304 Broadway. 38 10*

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., having had many applications for castings from their lathe patterns, with beds planed and screw and gearing cut, have now made arrangements to accommodate that class of customers; this arrangement will enable small shops, with a little more than half of the amount of ready cash, to get them a new lathe. Cuts of these lathes and other tools can be had by addressing as above (post-paid). N. B. Machinists' tools constantly on hand. 40tf

MECHANICS' INSTITUTE FAIR.—The attention of Mechanics, inventors, and artisans is especially called to the Polytechnic Exhibition, which will open at the rooms, cor. Bowery and Division st, on the 15th of May. Those who wish to exhibit models, machinery, &c., of mechanical skill, and those who would like to carry on, permanently, any mechanical occupation that would be in any way curious or attractive to visitors, are requested to call on the Actuary. Steam power will be provided. Well-lighted, warmed, and airy rooms can be had on liberal terms. As this Exhibition is permanent, an excellent opportunity is offered to skillful mechanics to bring themselves into notice. Articles may be sent in immediately and will be taken care of and insured. Z. PRATT, Prest.; T. C. DODD, Actuary. 34tf

© 1851 SCIENTIFIC AMERICAN, INC.

Scientific Museum.

Steam Carriages for Public Roads, Balloons &c.

It is well known that it has often been attempted to make steam carriages on common roads. Many attempts have been tried and failed, but still there are others who are not yet discouraged. In Bristol, England, a steam carriage lately patented, has been brought out as the invention of Messrs. Clark & Motely.

The entire machine is intended to consist of an engine of from six to ten horse power, to which is attached an omnibus or long-bodied carriage, capable of accommodating forty persons and a certain quantity of luggage. With this load the patentees assert the capability of their invention to attain an average speed of ten miles per hour on ordinary roads, and the power of ascending inclines of one in six or eight. A speed of sixteen miles an hour might be checked and the engine brought to a stand-still in the space of sixteen feet.

The engine comprises an apparatus for steering with certainty at any required speed, on any kind of road. Suspension of machinery in such a manner that all jolts or concussions arising from bad roads shall not be injuriously communicated to the machinery, so that wear and tear will be considerably reduced. The power to be increased or decreased according to the state of roads, or the resistance to be overcome. A boiler of the strongest mechanical form with the least possible weight of material.

The most economical application of the steam power, by keeping the cylinder hotter than the steam employed therein, by which all condensation of the steam during its expansion is prevented, and to work the steam at such a pressure that the greatest effect may be produced by being worked expansively.

The carriage frame is made of sheet iron, rivetted together in such a manner, that the water tanks, &c., may be formed of the same, so that it will be strong and of light weight.

Flying Ship.

Near Hoboken village on the other side of the river, opposite our city, there is a strong enclosure 290 feet long, in which is a most wonderful apparatus—or rather huge artificial dragon nearly ready for launching. It is a huge cigar shaped balloon 260 feet long and 24 its greatest diameter. It has a car 64 feet in length, very sharp at either end, width 5 feet, height 6 feet 4 inches, the whole composed of a strong, light wooden frame covered with canvass, with doors and glass windows. It is to be propelled by two of the most beautiful engines ever constructed. They are made of gun metal and cast steel, are of 12 horse power, and are to work 20 inch stroke 66 times per minute, which will give 400 revolutions to two propelling fans. The entire weight of the car, float and fixtures is but about 4,000 pounds, leaving 2,500 pounds surplus. It is designed to run about 200 feet above the surface of the earth at a rate of speed varying from 25 to 50 miles per hour. It is calculated that the gas will have an upward buoyant force sufficient to raise more than 6,000 lbs. above the ground. The engines only weigh 181 lbs. They are constructed by Mr. Robjohn, a most ingenius mechanician, one who can make a balloon go if neat and well constructed machinery can do it.

It is designed to drive this vessel by steam, and to obviate the necessity of coal, Mr. Robjohn says he has discovered a plan of decomposing water, which is converted into steam, by the combustion, and this steam is again condensed and returned for decomposition.

The most skillful and best of men are oftentimes led away by enthusiasm, and it is a good thing for science perhaps that it is so.

Great Balloon Ascension.

Mr. John Wise, the veteran æronaut of Lancaster, Pa., made a splendid ascension from Philadelphia, last Monday, (21st) in his large balloon named the Hercules. The cost of the balloon and rigging was $2,600. It was manufactured of prepared silk. Its size is immense, and said to be the largest ever made in this country. It is capable of containing 41,000 cubic feet of gas.

At five minutes past six o'clock, about 37,000 cubic feet had been obtained, when Mr. Wise, not wishing to weary the patience of his friends, disconnected the tube from the balloon, and prepared for a departure from *terra firma*. At 15 minutes past 6 o'clock a topical ascension was made. The *voyageurs* were Mr. Wise, his wife and son, Miss E. Denton, and W. R. Stockton, of Spring Garden. The ballon rose gracefully, to the height of over one hundred feet, and remained stationary for a few minutes. It was then drawn down by means of a windlass to which the end of the rope was affixed.

At half-past 6 o'clock, the rope was cut, and the balloon, with the same persons, shot upwards, and continued to rise to a great height, perpendicularly. It afterwards took a northeasterly direction, and was perceptible to view for nearly an hour. The audience within the enclosure was entirely orderly and expressed the greatest approbation of the skill and success of the æronaut.

It takes friend Wise to do the thing up in grand style; but this balloon has since been torn.

Railway Guages.

It would be a good thing if all the railroad tracks in our country, were of the same width; but what is the best guage some will say. Almost all our railroads have the narrow guage—the New York and Erie Railroad however has the broad guage—a splendid track, and we can have various guages in this State. It would appear that other States have strange notions about such things. The Cincinnati Gazette says:—

The laws of Ohio establish the guage or width of the railway track at 5 feet 10 inches, while those of Indiana fix their guage at 5 feet 8½ inches—making a difference of an inch and a half in the width of the tracks. This difference is sufficient to prevent the use of the same rolling machinery on both tracks. It is vexatious and detrimental to the interest of railway companies in both States. The legal gauge in both States was inconsiderately adopted, looking to no practical good. Roads in each State have been built, and are now run with machinery adapted to each guage, and difficulty is experienced in connecting the lines of road of different guages so as to secure the greatest advantage with the least delay and cost of transportation.

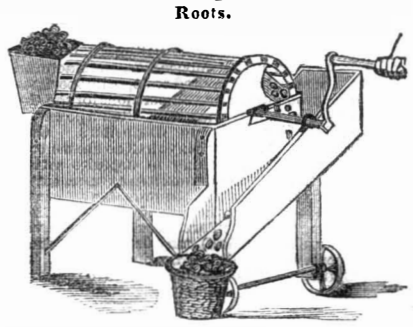
(For the Scientific American.)

Does the Moon Influence the Weather.

Some will say yes, and anwser—so sure as decomposition takes place in fish, flesh, or fowl, when exposed to her rays, so sure does she influence the weather; aye, and human nature too, as well as the earth's surface. The above inquiry is near about as old as Adam's time, it is by thousands booked as a chimera of the brain, and by hundreds an established fact derived from observation and experience. Hewers of wood and sowers of seed know as much, and probably more, about the moon's influence than the French astronomers can, in their vibratory ideas, begin to know. I give Mr. Alexander all the credit he can get for his theory, though I must confess I am a little skeptical as to its truthfulness. Adam Clark or Wesley, I forget which, based a meteorological table on the like-father-like-son principle, though their own disciples could never see anything in it. The sixteenth century was big with hieroglyphics and prognostications on the weather, &c. William Lilly, about that period, famous for his success in the prognosticatory art, told of the fire of London in 1666, as well as the plague the year previous, fourteen years before they happened; the consequence was, as all the world knows, "a singular fact," considering the many deficiencies in the category of stars at that time it is truly wonderful how so many of their suppositions or predictions should be realized. But, to return more directly to the subject of inquiry (by the way it is a large field, and one that would afford a good deal of speculation among the wise heads at Washington and Cambridge): the way to arrive at the true theory of the moon's influence is to make a chart of the heavens at the exact conjunction (new moon) of the two great luminaries, which can readily be done by an astronomical ephemeris or the nautical almanac—the former contains the geocentric longitudes of the planets, while the latter gives only the R. A. in hours and minutes, which must be turned into degrees and minutes, reckoning from the first point of Aries, then, should Saturn, Mars, or Herschel be found in opposition (180°) or square to the Moon's place, and she in a watery sign, viz., Pices, Scorpio, or Cancer, the observer will find a superabundance of the watery element to descend at that period; should the Moon be in Aries, Libra, or Capricorn, then hurricanes may be looked for. I regret not being in possession of either of the above almanacs for 1851, nor have I time to calculate the planets' places just now, or I would give some observations on the weather in prospective.

X. Y. Z.

A Machine for Washing Potatoes and other Roots.



This is an Archimedean potatoe washer. The roots to be washed are placed in the cylinder at the farthest end from the crank, the cylinder being partly immersed in water. By turning the handle in one direction the roots are washed; and when sufficiently cleaned, by turning it in the contrary direction, the Archimedean screw inside the cylinder instantly empties out the contents, as shown in the illustration.

This machine may be very useful to some of our farmers. It is to be hoped that more of such machines will come into use. We like to see the labor of the farmer economized by machinery. Animals should be fed with more roots during the winter season than they generally are. Potatoes, turnips, beets, &c., should be more generally fed out to both cattle and sheep. These roots should be well washed, and this machine will greatly facilitate and make the labor of washing such roots more agreeable.

Improvement in the Manufacture of Sugar.

We learn by the London Mechanics' Magazine, that Mr. John M. Frazer, of London, has taken out a patent for the following method—briefly condensed by us—for improvements in the manufacture of sugar.

The expressed cane juice is poured into an open vessel through a seive containing about one pound of quick lime. A similar quantity of lime is mixed with about a gallon of juice in a vessel, and kept ready for use. This quantity of lime is sufficient for two hundred and twenty gallons of juice. When about one hundred gallons of juice are run into the vessels, the mixture of lime and juice in the vessel is put in along with half a gallon of sulphurous acid of the gravity of 1·05, containing 30 volumes of gas to one of water. When the whole 220 gallons of juice are run in, ¼ of a gallon of the sulphurous acid is added and the whole well stirred and allowed to settle. The clear liquor is then drawn off and boiled in an open pan. The scum is carefully removed and the liquor gives out a peculiar odor, which decreases as the boiling is continued. The liquor is at first a deep brown, then green, then becomes a rich golden color throwing up yellow flakes. When the color is quite clear, the boiling is discontinued, and the liquor is then fit for evaporation and crystalization in the common way. The boiling may be done in the vacuum pan, care being taken to remove the scum when the liquor is about the density of 38° Beaume.

New Waterproofing Composition for Cotton and other Fabrics.

M. Cleste Menotti, of Paris, has recently invented and patented the following waterproofing composition which he denominates "hydrofugene." In a vessel capable of containing 3 gallons place 22 lbs. of alum or sulphate of copper reduced to powder. In a second vessel like the other place 14 ozs. of oleic acid, or the stearine of commerce, or good soap. The soap or stearine is dissolved by heat in 2 gallons of alcohol, and then poured on the alum or sulphate of copper, and the whole submitted to a high temperature, when the "hydrofugene" is obtained or rather is the result of the mixture of these compounds. It can thus be obtained in a dry or moulded state. To water-proof cotton or linen fabrics, dissolve 1 part by weight of the "hydrofugene" in 100 parts of water dip the cloth in it, and hang it up to dry. Treat silk or pasteboard in the same way.

This water-proof composition permits the air to pass through the cloth, but prevents water from doing so. This is a very excellent water-proofing composition; we hope that our readers will take advantage of this information.

LITERARY NOTICES.

FRUITS OF LEISURE.—This is the title of a neat volume, published by Anson D. Randolph, 669 Broadway, and a most excellent book it is. It is the first American from the fourth London edition. It comprises essays written in the intervals of business, and they contain admonitions to men in every station and condition of life. It is a work full of practical wisdom, and we cannot find language strong enough to commend it to our young men, more especially our young men engaged in the mercantile profession; they will find in it many "gems of purest ray serene." One essay on "The Education of the Man of Business," is one of the most profound productions we have ever read.

SHAKSPEARE'S POETICAL WORKS.—The last number of Phillips, Sampson & Co.'s beautiful edition of Shakespeare's works is just issued, rendering it complete for binding. We thank the publishers for the prompt manner in which they have furnished us the numbers from the beginning.

SARTAIN'S UNION MAGAZINE, for August has a great variety of beautiful engravings, and a choice collection of reading for the ladies.

GRAHAM'S AMERICAN MAGAZINE, for August, has a splendid engraving of the "Tomb of Washington," besides several others of merit, and an excellent variety of articles from our most popular authors. Each of the above magazines are for sale by Dewitt & Davenport, Tribune Buildings, New York.

MECHANICS

INVENTORS
AND
MANUFACTURERS.

The Best Mechanical Paper
IN THE WORLD!
SIXTH VOLUME OF THE
SCIENTIFIC AMERICAN.

The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the SIXTH VOLUME of this valuable journal, commenced on the 21st of September last. The character of the SCIENTIFIC AMERICAN is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

It enjoys a more extensive and influential circulation than any other journal of its class in America.

It is published weekly, as heretofore, in *Quarto Form*, on fine paper, affording, at the end of the year, an *ILLUSTRATED ENCYCLOPEDIA*, of over FOUR HUNDRED PAGES, with an Index, and from FIVE to SIX HUNDRED *ORIGINAL ENGRAVINGS*, described by letters of reference; besides a vast amount of practical information concerning the progress of SCIENTIFIC and MECHANICAL IMPROVEMENTS, CHEMISTRY, CIVIL ENGINEERING, MANUFACTURING in its various branches, ARCHITECTURE, MASONRY, BOTANY,—in short, it embraces the entire range of the Arts and Sciences.

It also possesses an original feature not found in any other weekly journal in the country, viz., an *Official List of PATENT CLAIMS*, prepared expressly for its columns at the Patent Office,—thus constituting it the "*AMERICAN REPERTORY OF INVENTIONS.*"

TERMS—$2 a-year; $1 for six months.
All Letters must be Post Paid and directed to
MUNN & CO.,
Publishers of the Scientific American,
128 Fulton street, New York.

INDUCEMENTS FOR CLUBBING.

Any person who will send us four subscribers for six months, at our regular rates, shall be entitled to one copy for the same length of time; or we will furnish—

10 copies for 6 mos., $8 | 15 copies for 12 mos., $22
10 " 12 " $15 | 20 " 12 " $28

Southern and Western Money taken at par for subscriptions.

PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

© 1851 SCIENTIFIC AMERICAN, INC.